INDUSTRIAL MEDICINE *and* SURGERY

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American Association of Railway Surgeons
Seventy-Third Annual Meeting

NOVEMBER 1961

Volume 30 Number 11

The International Journal of Medicine in Industry

In skeletal muscle spasm

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quickly resolves the spasm . . .

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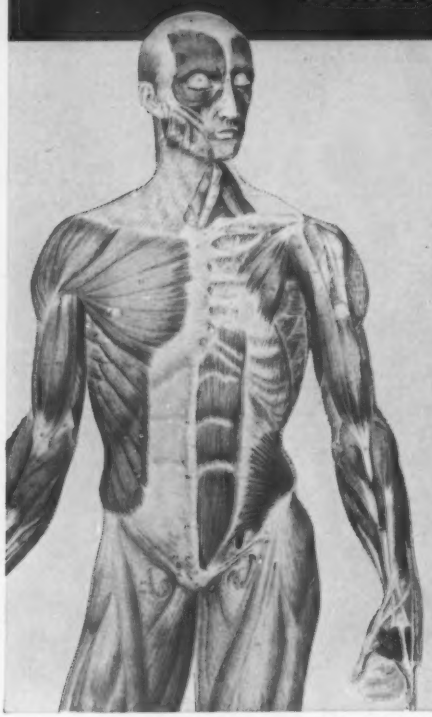

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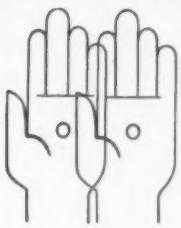

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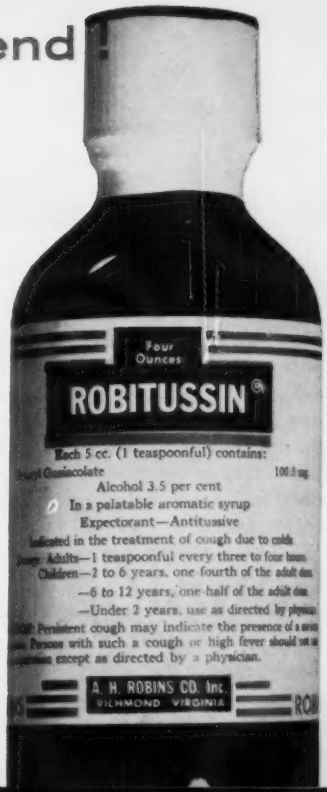

*Cass, L. J., and Frederik, W. S., Am. Pract. Dig. Treat., 2:844, 1951.

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INDUSTRIAL MEDICINE and SURGERY

ESTABLISHED 1932

The International Journal of Medicine in Industry

NUMBER 11
VOLUME XXX
NOVEMBER, 1961

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INDUSTRIAL MEDICINE AND SURGERY, The Journal of Medicine in Industry, consolidating "The Industrial Doctor," "Industrial Medicine," and "International Journal of Medicine and Surgery": Entered as second class matter August 28, 1941, at the Post Office at Chicago, Illinois, under the Act of March 3, 1879. Reentered, October 3, 1949. Additional entry at Sheboygan, Wisconsin. Published on the fifth of each month by INDUSTRIAL MEDICINE PUBLISHING COMPANY, Miami, Florida. STEPHEN G. HALOS, Chairman; STEPHEN F. HALOS, President; HAROLD A. HOOPER, Treasurer; CAREY P. MCCORD, M.D., Editor; A. D. CLOUD, Editorial Consultant; LUCILLE H. GROSS, Circulation Manager; T. W. PINKARD, Production Manager. EXECUTIVE OFFICES, 400 S.W. 69th Avenue, Miami 44, Florida. PUBLICATION, EDITORIAL AND CIRCULATION matters should be addressed to P. O. Box 44-306, Miami 44. Subscriptions in United States $6.00 per year, $10.00 for 2 years; in Canada $8.00 per year, $14.00 for 2 years; in other countries $12.00 (U.S. Currency) per year, $20.00 for 2 years. Single copies $1.25. Title Registered in United States Patent Office. Registered Canada, 1942.

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PERSONAL NEWS AND NOTES

THOMAS W. NALE, M.D., Medical Director of Union Carbide Corp., has been named chairman of the National Advisory Committee, Manufacturing Chemists' Association, Inc. He succeeds R. EMMET KELLY, M.D., Medical Director of the Monsanto Chemical Company.

Formerly a director of the West Virginia State Health Department, DR. NALE joined Union Carbide Chemicals Company in 1941. He was transferred to the Industrial Medicine and Toxicology Department of Union Carbide in 1946.

An Associate Clinical Professor of Industrial Medicine, New York University Post-Graduate Medical School, New York, DR. NALE is a Fellow of the American Academy of Occupational Medicine and American Industrial Hygiene Association; Diplomate, The American Board of Preventive Medicine — Occupational Medicine; a member of The Royal Society of Health, London, and the American Association for the Advancement of Science.

DR. NALE is also a member of the Labels and Precautionary Information Committee of MCA; the Medical Advisory Group, Employee Health and Benefits Committee, National Association of Manufacturers; and the Medical Advisory Committee, American Welding Society.

A four day full-time course on Surgical Rehabilitation of Arthritic Deformities will be offered by the New York University Medical Center from November 14 to 17 under the direction of ROBERT L. PRESTON, M.D., Associate Clinical Professor of Orthopedic Surgery, in cooperation with CURRIER MC EWEN, M.D., and EDWARD F. HARTUNG, M.D., of the Department of Medicine.

The course is designed for the experienced orthopedic surgeon who is interested in the techniques for the surgical correction of arthritic deformities and the rehabilitation of patients who are handicapped by arthritis. Sessions are also open to a limited number of experienced rheumatologists.

The course will include practical demonstrations, lectures and panel discussions by members of the New York University faculty and a visiting faculty. Guests will be DRS. ANTHONY F. DE PALMA, Jefferson Medical School; CHARLES W. GOFF, Yale University School of Medicine; AUSTIN MOORE, Columbia Hospital, South Carolina; and THEODORE A. POTTER, Boston University School of Medicine.

Tuition for the course is $85. For applications contact the Office of the Associate Dean, New York University Post-Graduate Medical School, 550 First Avenue, New York 16, N. Y.

DANIEL C. BRAUN, M.D., has been appointed Assistant Medical Director, Divisions and Associated Subsidiaries, United States Steel Corporation, according to ROBERT B. O'CONNOR, M.D., Medical Director for the Corporation.

DR. BRAUN joined DR. O'CONNOR'S headquarters staff in Pittsburgh, Pa., after three years as Plant Medical Director for the Corporation's Homestead District Works, Munhall, Pa. During the preceding six years, DR. BRAUN was Medical Director of the Industrial Hygiene Foundation of America and a Senior Fellow at the Mellon Institute of Industrial Research in Pittsburgh.

From 1944 to 1950, DR. BRAUN was Medical Director for Pittsburgh Coal Company, serving subsequently as a consultant in occupational medicine for Pittsburgh Coal Company, Westinghouse Electric Corporation and other industrial firms in the Pittsburgh area.

DR. BRAUN studied chemical engineering at Carnegie Institute of Technology and then transferred to the University of Pittsburgh School of Medicine where he obtained his medical degree in 1937. He is a Diplomate of the American Board of Preventive Medicine in Occupational Medicine and a Fellow of the American College of Chest Physicians, the American Academy of

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Physicians and nurses from Olin Mathieson Chemical Corporation plants throughout the country met in New York recently for the company's first conference on industrial medicine. During the opening session, Mac Roy Gasque, M.D., corporate Medical Director, noted that one purpose of the meeting was to establish systems of communication among doctors that would lead to improved medical service for all Olin employees. Medical subjects discussed included: The Post Coronary Employee; Control of Radiation Problems; Planning for In-Plant Emergencies, and Overseas Travel.

Occupational Medicine, the Industrial Medical Association, the American Public Health Association, and the Pittsburgh Academy of Medicine.

DR. BRAUN was Instructor, Department of Industrial Hygiene, School of Medicine, University of Pittsburgh, and now is Lecturer in Occupational Health at the Graduate School of Public Health, University of Pittsburgh.

DAVID JOE SMITH, M.D., has been appointed Plant Medical Director for United States Steel Corporation's Homestead District Works at Munhall, Pa., succeeding DR. D. C. BRAUN.

For the past two years, DR. SMITH has been Plant Medical Director at the Corporation's Edgar Thomson Works, Braddock, Pa. In his new position, DR. SMITH will be in charge of industrial medical activities at three plants comprising the Homestead District — the Homestead Steel Works at Munhall, Carrie Furnaces at Rankin, and the Wheel & Axle Division at McKees Rocks, Pa.

Before joining United States Steel, DR. SMITH was Medical Director for L. S. Ayres & Company, Indianapolis, Ind., from 1953 to 1959.

DR. SMITH graduated from Indiana University Medical School in 1942. He is a Fellow of the Industrial Medical Association.

JOSEPH B. BENTZ, M.D., has been appointed Plant Medical Director at U. S. Steel Corporation's Edgar Thomson Works, Braddock, Pa. He succeeds DR. D. J. SMITH who was appointed Plant Medical Director at the Corporation's Homestead District Works.

DR. BENTZ received his M.D. degree from Temple University Medical School, Philadelphia, in 1949. He came to Pittsburgh in 1957 and joined the medical staff of the Pennsylvania Railroad Company. At the same time, he attended the Graduate School of Public Health at the University of Pittsburgh where he obtained a master's degree in public health in 1958. He then engaged in a year's in-plant training at the Bettis Atomic Plant of Westinghouse Electric Corporation before joining U. S. Steel in June, 1960.

WILLIAM M. WOODWARD, M.D., has been appointed Plant Physician at U. S. Steel Corporation's Homestead Steel Works, Munhall, Pa. Since 1955, DR. WOODWARD has been Regional Medical Officer for the Pittsburgh region of the Pennsylvania Railroad Company, following two years as internist for the railroad in Philadelphia.

DR. WOODWARD received his M.D. degree from Jefferson Medical College in 1946. He is an Assistant Clinical Professor of Occupational Medicine at the University of Pittsburgh.

"Back Pain," one of the most frequent complaints encountered by the practicing physician, will be the title and subject for a short conference to be held by University of California Medical Extension, December 2 and 3. Meeting place will be room 13-105 of the Medical Center at UCLA.

ALLEN S. RUSSEK, M.D., Director of the Department of Physical Medicine and Rehabilitation at the Hospital for Joint Diseases in New York, and attending physician for the New York University School of Medicine, will be guest speaker. Other Instructors will be from the UCLA School of Medicine, with WILBUR A. SELLE, Clinical Professor of Physical Medicine and Rehabilitation and Professor of Biophysics and Nuclear Medicine at UCLA, as course chairman.

Requests for additional information or applications for the course may be made to THOMAS H. STERNBERG, Assistant Dean in Charge of Postgraduate Medical Education, UCLA Medical Center, Los Angeles, 24.

The 68th Annual Meeting of the Association of Military Surgeons of the U. S. will be held November 6, 7, and 8, 1961, at the Mayflower Hotel in Washington, D. C. Theme of the meeting is "International Medicine — Path to World Progress." Invitation to attend is extended to all. Retirement point credits for Reserve Officers will be given, and there is no registration fee.

The Executive Council of the Association of Military Surgeons of the United States announces the appointment of MAJOR GEN. THOMAS J. HARTFORD, Deputy Surgeon General of the Army, to the position of Executive Director of the Association, effective October 15, 1961. He will retire from the Army on September 30, with more than 30 years military service.

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In announcing the appointment LEROY E. BURNEY, M.D., President of the Association said: "GENERAL HARTFORD brings to our Association his long years of experience in administration and military medical matters. He will give his full attention to the administration of the Association which will permit COLONEL ROBERT E. BITNER to devote more time to expanding the services and influence of the Association as editor of *Military Medicine*."

LAWRENCE W. DIBERT, M.D., has been named Regional Medical Officer of the Pennsylvania Railroad's Pittsburgh Region, it was announced by Vice President MORTON S. SMITH.

While DR. DIBERT will have his office in Pennsylvania Station, Pittsburgh, he will direct the efforts of the medical officers and their staffs in the PRR's Pittsburgh Region, consisting of territories in western Pennsylvania, eastern Ohio, and northern West Virginia.

DR. DIBERT received his medical degree at the University of Pittsburgh in 1945. He joined the PRR's Pittsburgh Region medical staff in 1957 and has served since that time in the Pittsburgh area.

In January, 1962, a national symposium will be held at the University of Denver College of Law on "The Deaf in the United States with Emphasis on Driving and Employability."

The purpose of the program is to further develop the mobility and employability of the deaf. An additional aim is to improve the public image of the deaf. Denver Municipal Judge SHERMAN G. FINESILVER will direct the symposium — the first of its kind in the country. This will mark the first time legal, medical, safety enforcement and education representatives from throughout the country will meet with national leaders of deaf organizations, educators for the deaf, and rehabilitation officials for the purpose of developing a better community understanding.

The symposium will be sponsored by the University of Denver College of Law, and supported by a grant from the Office of Vocational Rehabilitation of the United States Department of Health, Education, and Welfare.

RICHARD D. BRUST, M.D., of La Porte City, Iowa, has been appointed Medical Consultant in the Office of Vocational Rehabilitation of the Department of Health, Education, and Welfare.

DR. BRUST, a commissioned officer of the Public Health Service, was transferred to his new post by SURGEON GENERAL LUTHER L. TERRY. He was formerly PHS Medical Officer in charge of the U. S. Quarantine Station and the Farm Placement Reception Center in Nogales, Arizona.

In his new post DR. BRUST will serve as staff associate to ROBERT D. WRIGHT, M.D., Assistant Director for Health and Medical Activities. He will assist in providing medical consultation on OVR programs, giving special attention to the development of improved undergraduate and graduate training programs in rehabilitation medicine.

DR. BRUST earned his M.D. at the University of Oregon Medical School in 1959, and has specialty training in pathology.

The formation of a seven man Workmen's Compensation Rehabilitation Advisory Committee for New York State has been announced by COL. S. E. SENIOR, Chairman of the State Workmen's Compensation Board. It is composed of six outstanding physicians in the field of physical medicine and rehabilitation plus the Assistant Education Commissioner in charge of vocational rehabilitation.

The Advisory Committee members are:

ARTHUR S. ABRAMSON, M.D., Professor and Chairman, Department of Rehabilitation Medicine, Albert Einstein College of Medicine of Yeshiva University; Fellow, American Medical Association; Fellow, American College of Physicians; Fellow, New York Academy of Medicine; Diplomate, American Board of Physical Medicine and Rehabilitation.

DONALD A. COVALT, M.D., Professor, Department of Physical Medicine and Rehabilitation, New York University College of Medicine; Associate Director, Institute of Physical Medicine and Rehabilitation, New York University Medical Center; Diplomate, American Board of Physical Medicine and Rehabilitation.

WILLIAM H. GEORGI, M.D., in charge of the Department of Physical Medicine and Rehabilitation in the Buffalo General Hospital; Physiatrist at the Buffalo Children's Rehabilitation Center; Attending Physiatrist at Buffalo Veteran's Hospital; and Associate Professor of Physical Medicine and Rehabilitation at the University of Buffalo Medical School.

LEO JIVOFF, M.D., Medical Director of the Cardiovascular Work Evaluation Unit of the Heart Association in Syracuse; Associate Professor and Chairman of the Department of Rehabilitation Medicine of the State University of New York College of Medicine at Syracuse; Medical Director of the Rehabilitation Center of the Syracuse University Hospital; and Consultant in Rehabilitation Medicine at the Onondaga County Home and Infirmary.

ADRIAN LEVY, Ph.D., Assistant Commissioner of Education for Vocational Rehabilitation in New York State Education Department.

NORMAN PLUMMER, M.D., General Medical Director, New York Telephone Company; Associate Professor of Clinical Medicine, Cornell University Medical College; Assistant Attending Physician, New York Hospital; Fellow, American College of Physicians; Fellow, New York Academy of Medicine; Member, Community Council, New York Heart Association.

JEROME S. TOBIS, M.D., Chief, Division Physical Medicine and Rehabilitation, Montefiore Hospital; Baruch Fellowship in Physical Medicine and Rehabilitation; Diplomate, American Board of Physical Medicine and Rehabilitation.

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1. Teitel, L. H., *et al.:* Indust. Med. *29*:150, 1960. 2. Billow, B. W., *et al.:* Southwestern Med. *41*:286, 1960. 3. Beck, C., *et al.:* Clin. Med. *7*:519, 1960. 4. Clinical Reports to the Medical Department, Armour Pharmaceutical Company, 1960.

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References: (1) Settel, E.: Clin. Med. *6*:1373, 1959. (2) Peak, W. P., and Smith, R. T.: Penn. Med. J. *63*:833, 1960. (3) Mayle, F. C.; Sullivan, P. D., and Auth, T. L.: Med. Ann. D. C. *28*:499, 1959. (4) Roth, J. L. A.: Med. Clin. N. Amer. *41*:1517, 1957. (5) Batterman, R. C., and Grossman, A. J.: J.A.M.A. *159*:1619 (Dec. 24) 1955.

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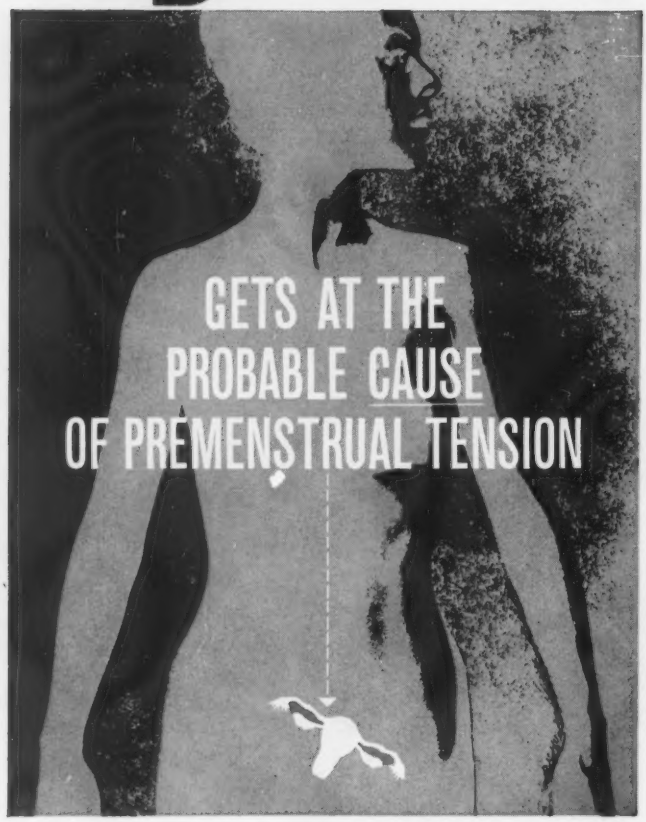

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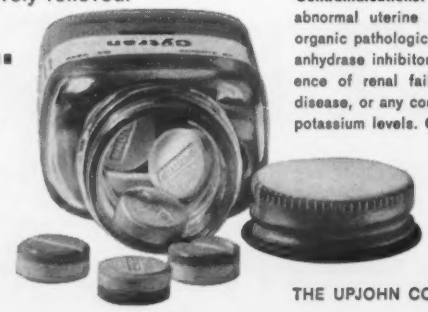

Each tablet contains:

Provera (medroxyprogesterone acetate)	2.5 mg.
Cardrase (ethoxzolamide)	35 mg.
Levanil (ectylurea)	300 mg.

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Contraindications: Cytran should not be used in patients with abnormal uterine bleeding until malignancy and all other organic pathologic conditions have been ruled out. Carbonic anhydrase inhibitors should not be administered in the presence of renal failure, hyperchloremic acidosis, Addison's disease, or any condition involving depressed sodium and/or potassium levels. Caution must be observed in the presence of symptomatic hepatic cirrhosis as acidosis may develop. Tranquilizing agents, generally, are not indicated in true depressive states without concomitant anxiety.

†TRADEMARK *TRADEMARK, REG. U.S. PAT. OFF.

THE UPJOHN COMPANY ■ KALAMAZOO, MICHIGAN

Everyday practice report:

Following initial clinical investigational work, Forhistal was sent to physicians throughout the country for evaluation as an antiallergic and antipruritic agent in everyday practice. Results in 6181 cases have now been analyzed. In 3419 cases in which a comparison was made, Forhistal was judged better than previous therapy in 7 out of 10 patients. Information about the investigational work done previously is being mailed to you separately and is also available on request.

SUPPLIED: *Tablets*, 1 mg. (pale orange, scored). *Lontabs*, 2.5 mg. (orange). *Syrup* (pink), containing 1 mg. Forhistal maleate per 5-ml. teaspoon. *Pediatric Drops* (pink), containing 0.5 mg. Forhistal maleate per 0.6 ml.

For complete information about Forhistal (including dosage, cautions, and side effects), see Physicians' Desk Reference or write CIBA, Summit, N.J.

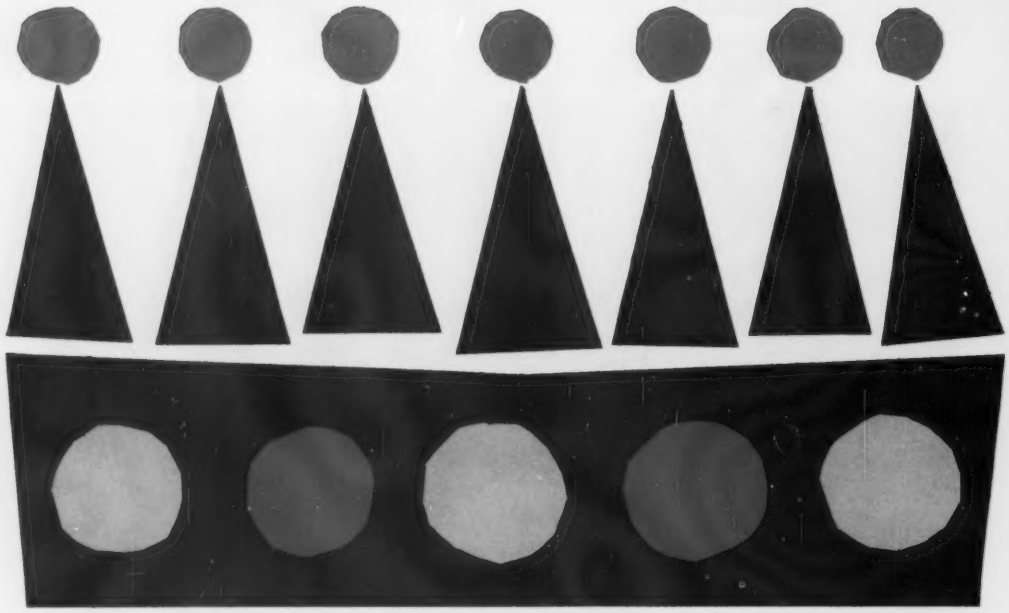
FORHISTAL® maleate (dimethpyrindene maleate CIBA)
LONTABS® (long-acting tablets CIBA)

new Forhistal®

rated better than previous therapy in 7 cases out of 10

CIBA
SUMMIT, NEW JERSEY

2/2910MR-1



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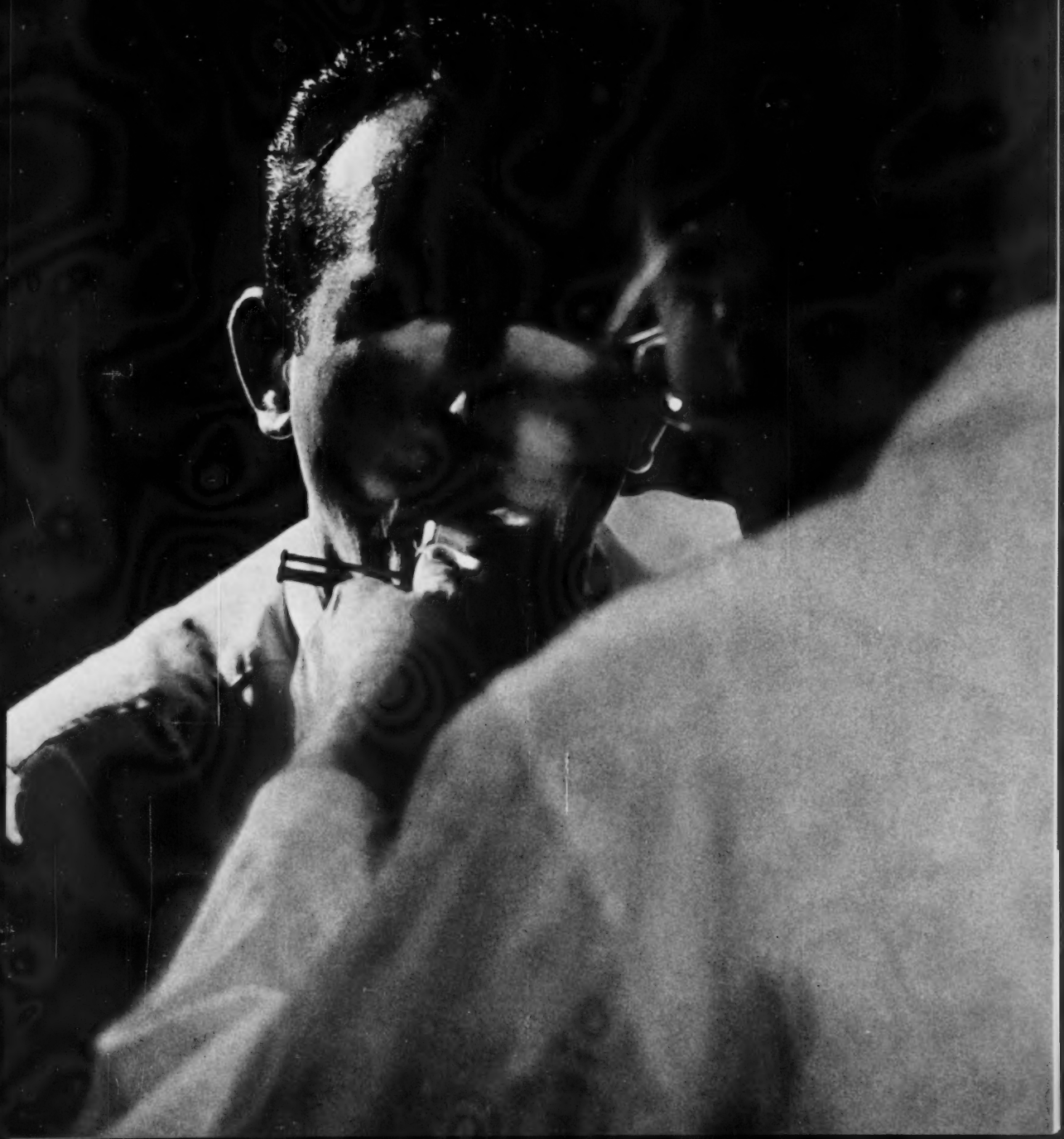
Increasingly...
the
trend is to
Terramycin®
OXYTETRACYCLINE WITH GLUCOSAMINE

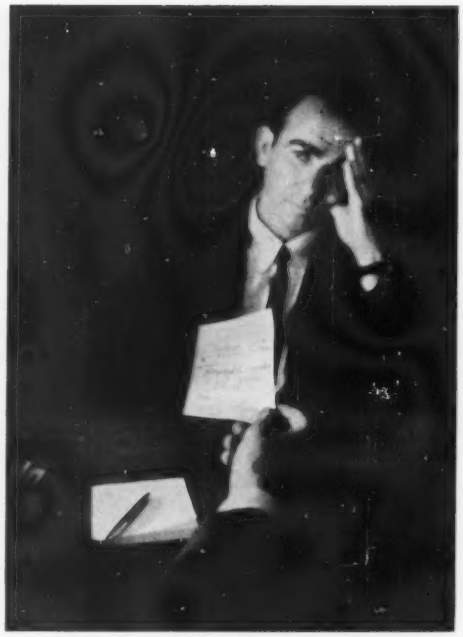
confirmed dependability in sinusitis is just one reason why



According to a recent report* on the effectiveness of Terramycin in 106 cases of upper respiratory tract infection: "The response in sinusitis was particularly gratifying, as both acute and chronic cases were controlled within an average of five days."

"It was the impression of the hospital staff that oxytetracycline [Terramycin] was not only better tolerated, but more effective than other antibiotics habitually used."

The results reported in this and many other studies confirm the vitality of Terramycin for broad-spectrum antibiotic therapy and demonstrate why —increasingly—the trend is to Terramycin.



In brief

The dependability of Terramycin in daily practice is based on its broad range of antimicrobial effectiveness, excellent toleration, and low order of toxicity. As with other broad-spectrum antibiotics, overgrowth of nonsusceptible organisms may develop. If this occurs, discontinue the medication and institute appropriate specific therapy as indicated by susceptibility testing. Glossitis and allergic reactions to Terramycin are rare. Aluminum hydroxide gel may decrease antibiotic absorption and is contraindicated.

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another reason why the trend is to Terramycin—*versatility of dosage form:*

TERRAMYCIN Syrup/Pediatric Drops

125 mg. per tsp. and 5 mg. per drop (100 mg./cc.), respectively—deliciously fruit-flavored aqueous forms . . . preconstituted for ready oral administration

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50 mg./cc. in 10 cc. vials; 100 mg. and 250 mg. in 2 cc. ampules—the broad-spectrum antibiotic for immediate intramuscular injection . . . conveniently preconstituted . . . notably well tolerated at injection site with low tissue reaction compared to other broad-spectrum antibiotics

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*Jacques, A. A., and Fuchs, V. H.: J. Louisiana M. Soc. 113:200, May, 1961.

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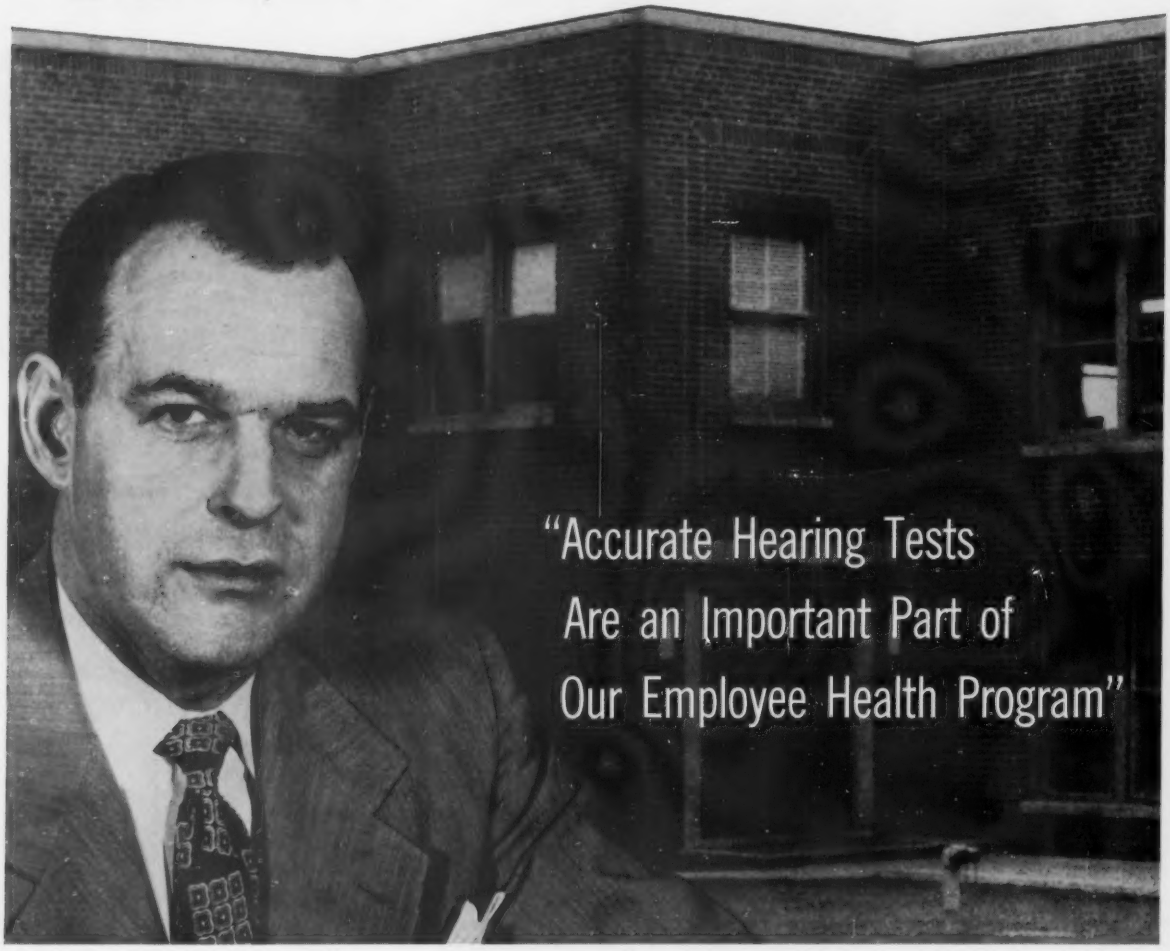
another industrial plant that relies on a....



"We know the importance of making accurate hearing tests for all our plant employees," says this company's Safety Administrator. "Our industrial health and safety program includes noise level reduction, personal protection in high noise areas and threshold hearing tests at regular intervals. With about 3,000 employees at this plant, this means our Maico Audiometer is in almost constant use, and, after nearly 10 years, is in excellent condition."

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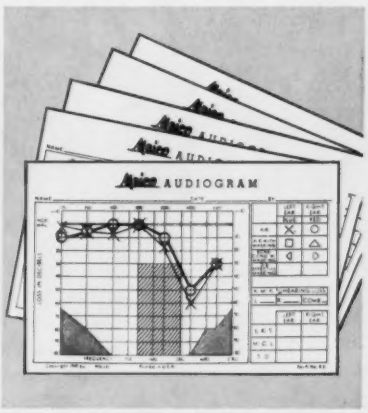
Hundreds of the nation's forward looking companies, have developed a hearing conservation program that protects the employees and management. Years of engineering research by Maico technicians in the laboratory and in the field have resulted in the world's finest and most accurate audiometers to augment hearing conservation programs. Government, schools, the armed forces and otologists recognize Maico as a leading maker of these fine precision instruments.

Maico Industrial Audiometer—The instrument of proven quality. Fast, accurate, dependable and easy to operate. Makes all hearing tests required for industrial hearing conservation program.

Maico Portable Audiometer—Can be easily carried from plant to plant or room to room. Handles all basic audiometric tests. Ideal for sweep checks or individual hearing analysis.



Maico Audiograms Are Legal Records—that assure you of permanent proof of a person's hearing acuity. They are your most dependable safeguard against unwarranted industrial deafness claims.

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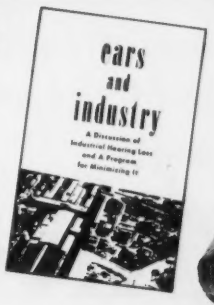

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Subsidiary of W. A. Sheaffer Pen Co.

THEN—postoperative analgesia meant lengthy immobilization with more complications and slower recovery.

Early mobilization is furthered with

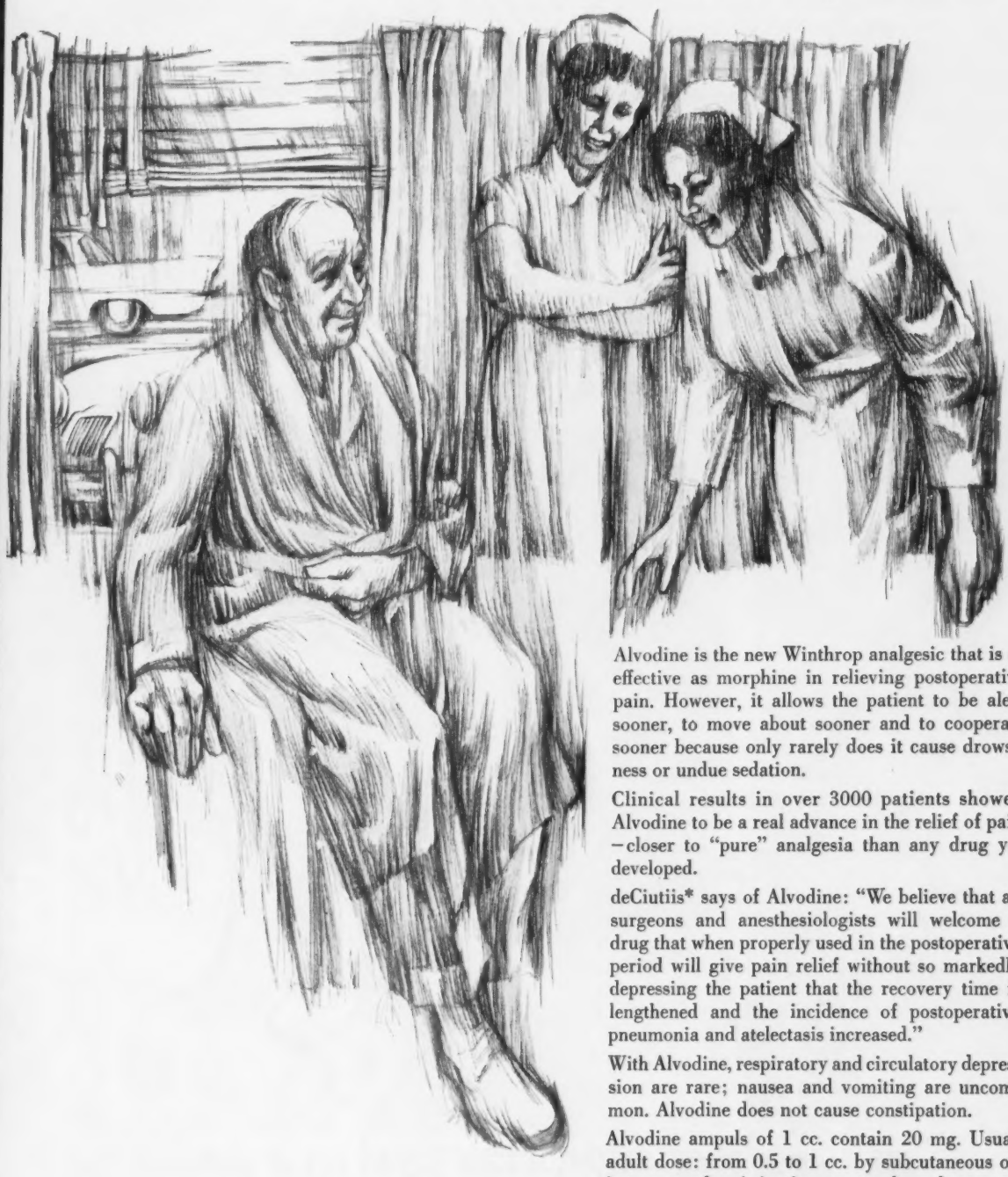
new Alvodine®

ethanesulfonate

Brand of piminodine ethanesulfonate

postoperative analgesia and alertness

NOW – postoperative analgesia usually means early mobilization, faster recovery and fewer complications.



Alvodine is the new Winthrop analgesic that is as effective as morphine in relieving postoperative pain. However, it allows the patient to be alert sooner, to move about sooner and to cooperate sooner because only rarely does it cause drowsiness or undue sedation.

Clinical results in over 3000 patients showed Alvodine to be a real advance in the relief of pain – closer to "pure" analgesia than any drug yet developed.

deCiutiis* says of Alvodine: "We believe that all surgeons and anesthesiologists will welcome a drug that when properly used in the postoperative period will give pain relief without so markedly depressing the patient that the recovery time is lengthened and the incidence of postoperative pneumonia and atelectasis increased."

With Alvodine, respiratory and circulatory depression are rare; nausea and vomiting are uncommon. Alvodine does not cause constipation.

Alvodine ampuls of 1 cc. contain 20 mg. Usual adult dose: from 0.5 to 1 cc. by subcutaneous or intramuscular injection every four hours as needed. Also available in scored tablets of 50 mg. for oral administration. *Narcotic blank required.*

*deCiutiis, V. L.: Evaluation of Alvodine: a new narcotic analgesic, a double blind study, *Current Res. Anesth. & Analg.*, 40:174, March-April, 1961.

Winthrop LABORATORIES New York 18, N. Y.

Alvodine (brand of piminodine ethanesulfonate), trademark reg. U.S. Pat. Off.

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ACE®* when it can stand up to punishment

For greater resistance to dry heat...B-D ACE Rubber Elastic Bandage incorporates a newly developed, heat-resistant **extruded** latex rubber. As a result, ACE withstands 320° F. dry-heat sterilization...maintains its elasticity longer than ordinary bandages. And remember, only ACE provides a balanced weave of warp and woof threads to assure continuous uniform support.

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This is the highly accurate Tuberculin, Tine Test

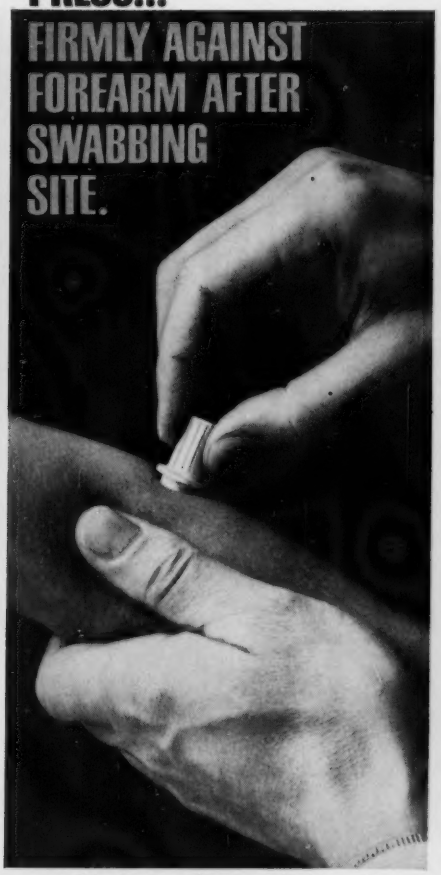
Each unit contains one complete tuberculin test: a plastic holder with stainless steel disc and 4 tines coated with Old Tuberculin and dried. Except for cleaning the site with alcohol, no preparation, clean-up or other materials are needed. Reactions, read 48-72 hours later, can be readily identified and measured accurately. A series of tests* performed in tuberculosis hospitals confirmed the accuracy of the Tuberculin, Tine Test compared with the Mantoux. In one group of 942 Mantoux positives, 97.8 per cent were positive by the Tine Test. Among another group of 436 bacteriologically proven cases, 97.7 per cent were positive by the Mantoux Test and 97 per cent by the Tine Test. For industrial, school or community programs, the LEDERLE TUBERCULIN, TINE TEST offers distinct advantages in speed, accuracy and economy.

Supplied: Box of 25 test units.

*Russell, W. F., Jr.; Lynch, H. J.; Doto, I.; and Furcolow, M. L.; Comparison of Tuberculin Skin Reactions: Tine Test vs. Intracutaneous, Scientific Exhibit, 110th Annual Meeting, A.M.A., New York, June 26-30, 1961.

PULL... STERILE, SELF-CONTAINED TEST UNIT OFF PLASTIC BASE.

PRESS... FIRMLY AGAINST FOREARM AFTER SWABBING SITE.



DISCARD DISPOSABLE PLASTIC UNIT.

The TINE TEST offers these advantages: ▪ Accuracy comparable to the Mantoux ▪ Adaptable to both mass testing and individual use in office practice ▪ Sterile, and disposable after one use—eliminating possible danger of cross-infection ▪ Easy to apply, permits uniform administration by auxiliary personnel ▪ Designed for rapidity, a physician and nurse team can test 25 individuals within two minutes ▪ Predetermined dose not subject to errors of measurement ▪ Multiple punctures help eliminate test failures, permit reactions to be read quantitatively ▪ Virtually painless, not frightening to children.

NEW LEDERLE TUBERCULIN, TINE TEST

(Rosenthal)

Request complete information on indications, dosage, precautions and contraindications from your Lederle representative or write to Medical Advisory Department.

LEDERLE LABORATORIES, A Division of American Cyanamid Company, Pearl River, New York

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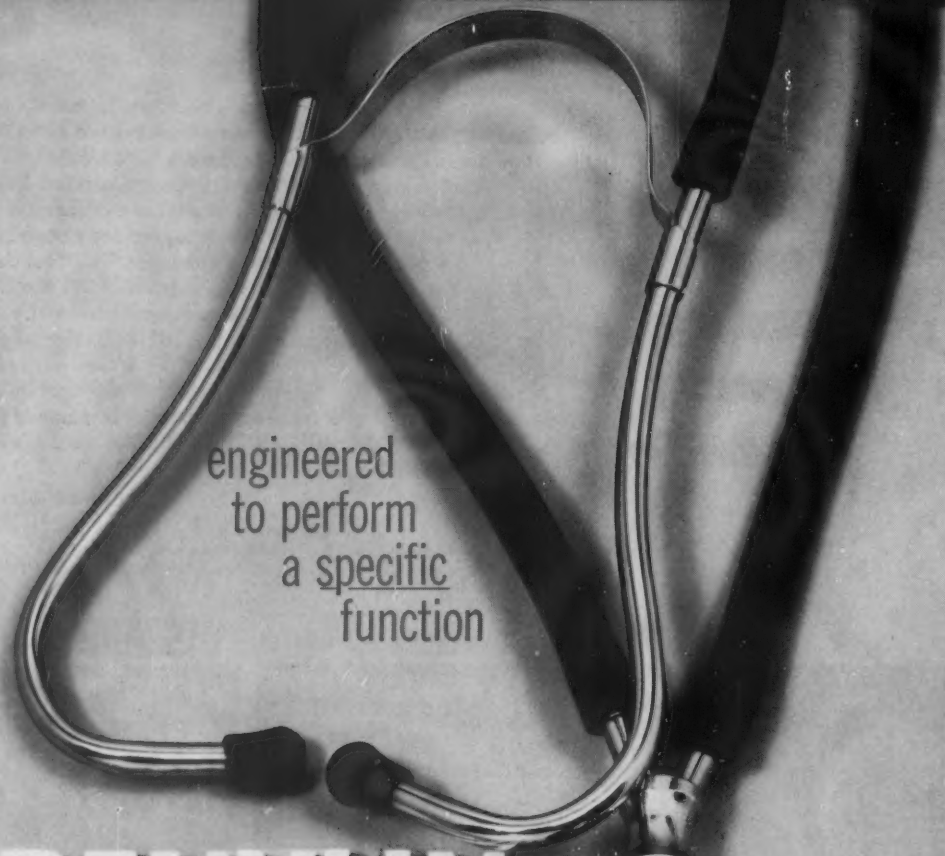


BENYLIN EXPECTORANT

specifically designed to help control cough

Just as a medical instrument is engineered for maximum efficiency in performing its specific function, BENYLIN® EXPECTORANT is formulated to provide effective relief of cough associated with colds or allergy.

The outstanding antitussive action of BENYLIN EXPECTORANT is attributed to a combination of carefully selected therapeutic agents. Benadryl,® a potent antihistaminic-antispasmodic, reduces bronchial spasm, quiets the cough reflex, and lessens nasal stuffiness, sneezing, lacrimation, itching, and other allergic manifestations. Concurrent respiratory congestion is relieved by expectorant agents that efficiently break down tenacious mucosal secretions. In addition, a demulcent action soothes irritated throat membranes. 5996I

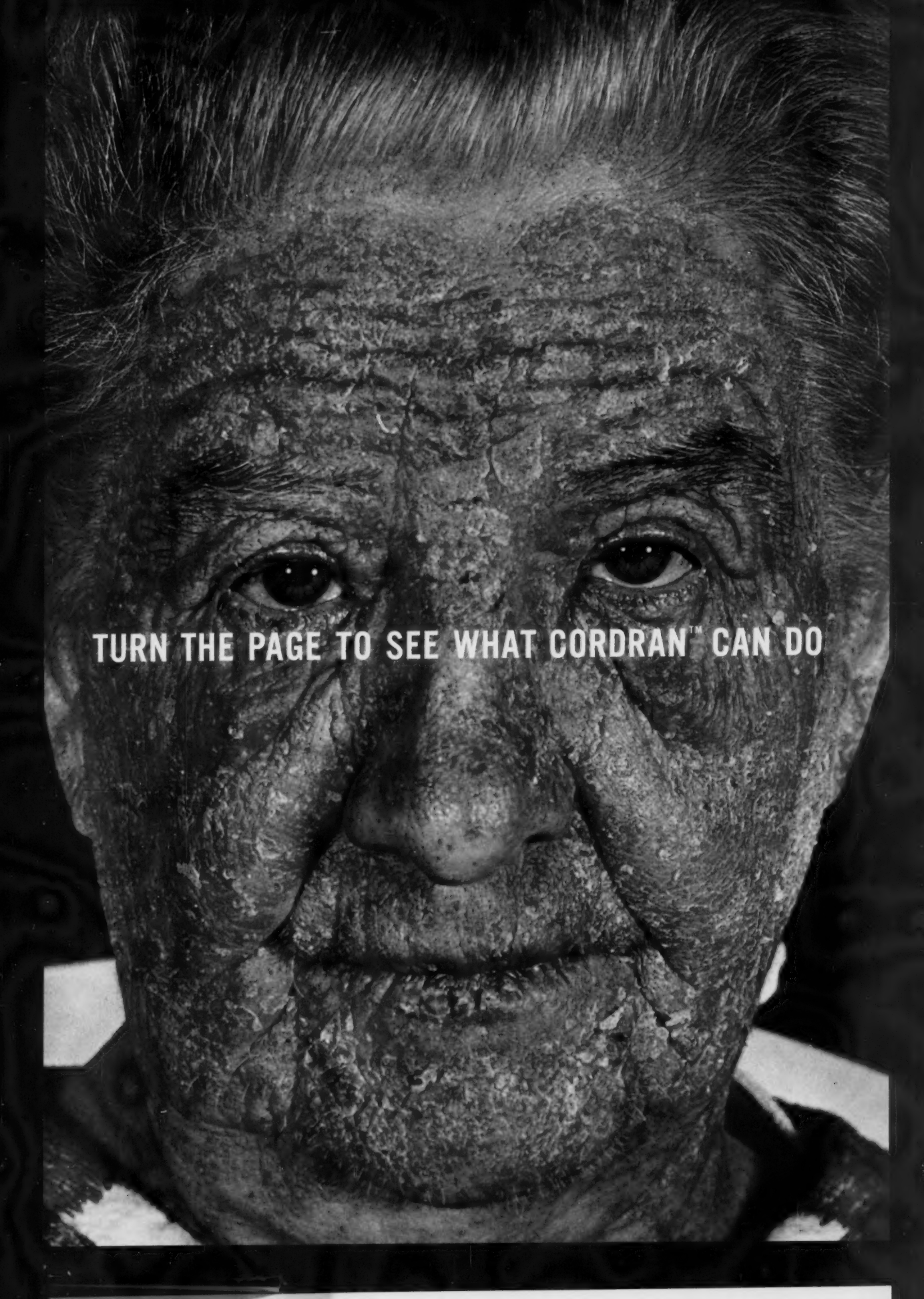
BENYLIN EXPECTORANT is a pleasant-tasting, raspberry-flavored syrup...completely acceptable to patients of all ages.

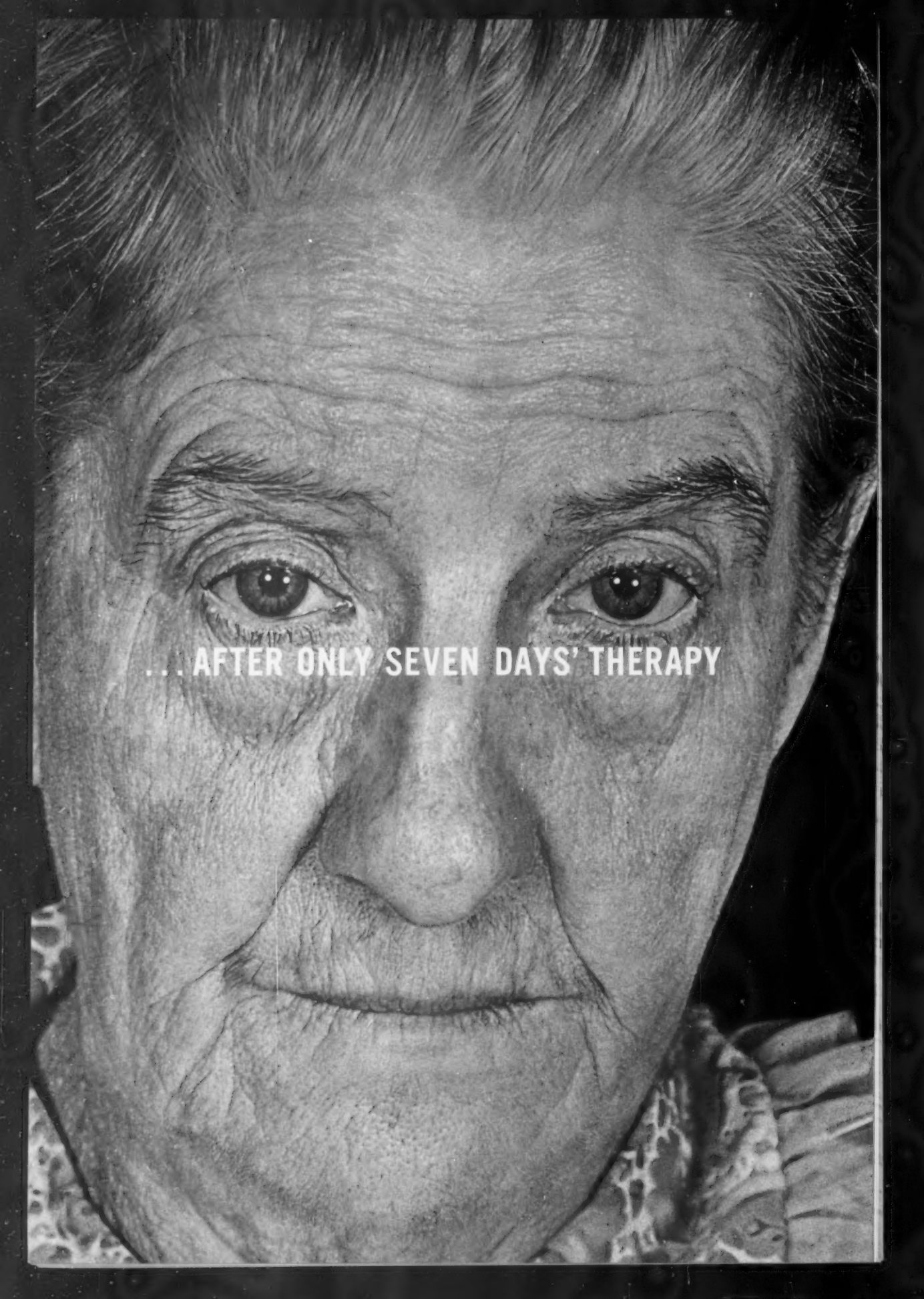
supplied: BENYLIN EXPECTORANT is available in 16-ounce and 1-gallon bottles.

Each fluidounce contains: 80 mg. Benadryl Hydrochloride (diphenhydramine hydrochloride, Parke-Davis); 12 gr. ammonium chloride; 5 gr. sodium citrate; 2 gr. chloroform; 1/10 gr. menthol; and 5% alcohol. *Indications:* Relief of coughs due to colds, other symptoms associated with colds, and coughs of allergic origin. *Dosage:* Adults—1 to 2 teaspoonfuls every three to four hours. Children—½ to 1 teaspoonful every four hours. *Precautions:* Products containing Benadryl should be used cautiously with hypnotics or other sedatives; if atropine-like effects are undesirable; or if the patient engages in activities requiring alertness or rapid, accurate response (such as driving).

PARKE-DAVIS

PARKE, DAVIS & COMPANY, Detroit 32, Michigan


TURN THE PAGE TO SEE WHAT CORDRAN™ CAN DO


. . . AFTER ONLY SEVEN DAYS' THERAPY

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new topical corticosteroid

CORDRAN™

provides superior antipruritic and anti-inflammatory activity

Among the advantages:

• high effectiveness in low concentration • specific topical action • no evidence of systemic absorption with ten to twenty times the usual dosage

...and to combat infection

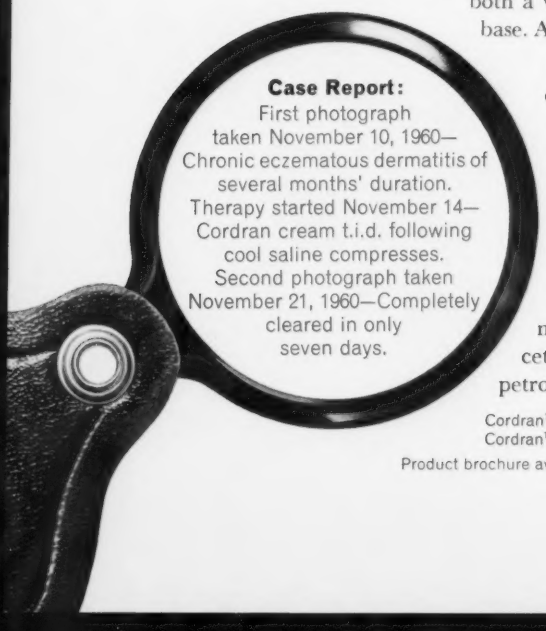
CORDRAN™-N

Cordran-N combines Cordran and the safe wide-spectrum antibiotic, neomycin. It is particularly useful in dermatoses complicated by potential or actual skin infections.

Product Description: Cordran and Cordran-N are available in both a vanishing cream and a hydrophilic ointment base. All forms are supplied in 7.5 and 15-Gm. tubes.

Each Gm. of Cordran cream and ointment contains Cordran, 0.5 mg. Each Gm. of Cordran-N cream and ointment contains Cordran, 0.5 mg., and neomycin sulfate, 5 mg. (equivalent to 3.5 mg. neomycin base).

The cream base is composed of stearic acid, cetyl alcohol, liquid petrolatum, polyoxyl 40 stearate, ethyl parahydroxybenzoate, glycerin, and purified water. The ointment base is composed of white beeswax, cetyl alcohol, sorbitan sesquioleate, and white petrolatum.

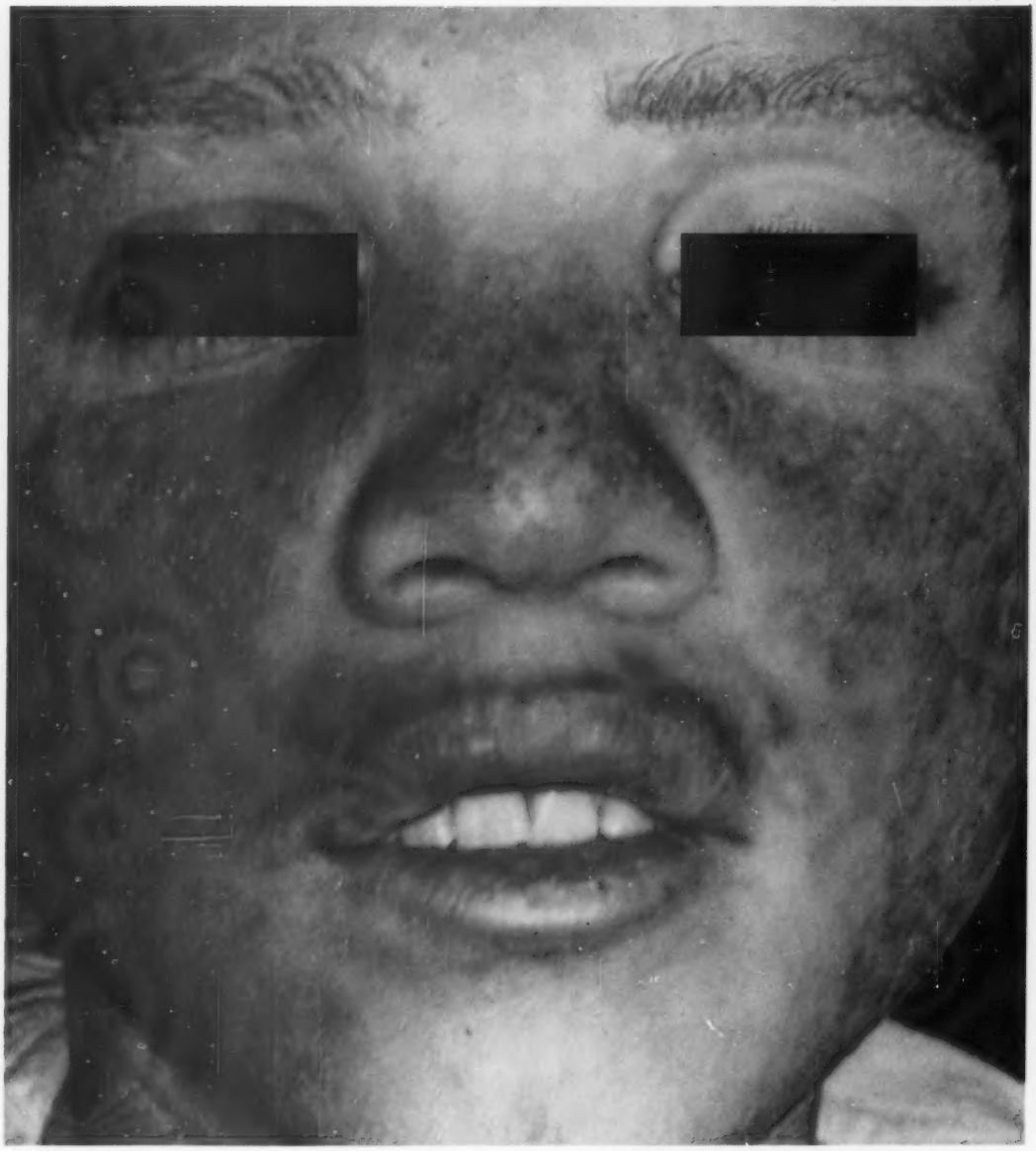

Case Report:
First photograph taken November 10, 1960—Chronic eczematous dermatitis of several months' duration. Therapy started November 14—Cordran cream t.i.d. following cool saline compresses. Second photograph taken November 21, 1960—Completely cleared in only seven days.

Cordran™ (flurandrenolone, Lilly)
Cordran™-N (flurandrenolone with neomycin sulfate, Lilly)

Product brochure available; write Eli Lilly and Company, Indianapolis 6, Indiana

a case for HALDRONE™

(paramethasone acetate, Lilly)



In severe cases of **SYSTEMIC LUPUS ERYTHEMATOSUS**, the new corticosteroid, Haldrone, has demonstrated rapid remission of symptoms with little adverse effect on electrolyte metabolism. Haldrone provides predictable suppressive activity in steroid-responsive conditions.

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Suggested dosage in systemic lupus erythematosus:
Initial suppressive dose. . 6-12 mg. daily
Maintenance dose . . . . 4-8 mg. daily

Supplied in bottles of 30, 100, and 500 tablets:
1 mg., Yellow (scored)
2 mg., Orange (scored)

140248

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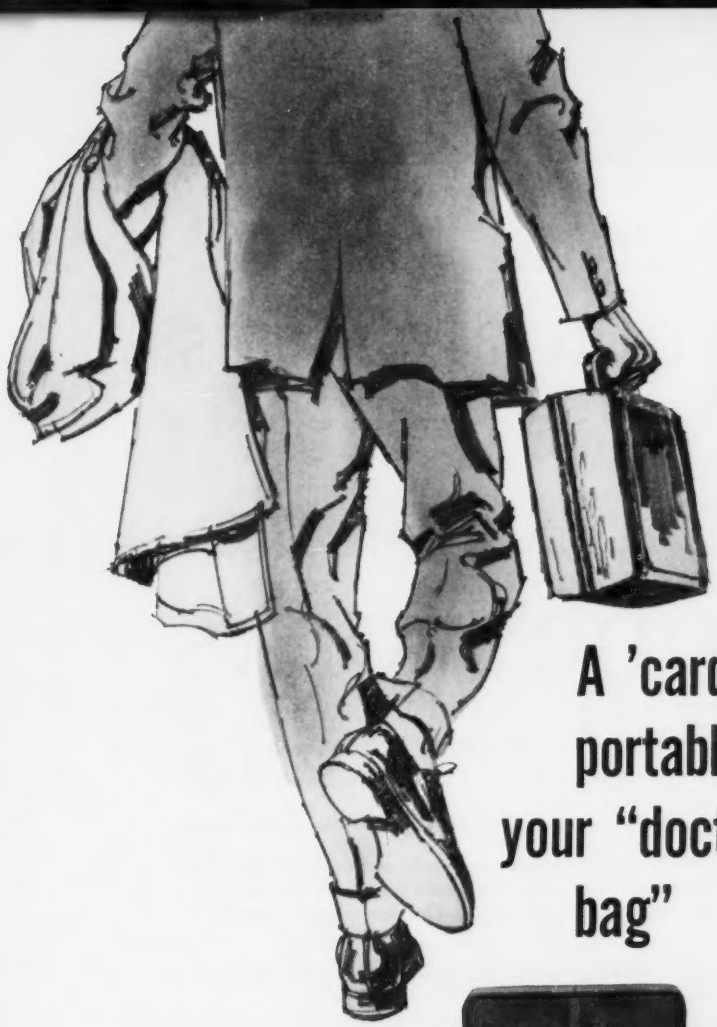


A 'cardiograph, portable as your "doctor's bag"

IT'S easy to take the Sanborn "300 Visette®" along on your house calls because it is compact and weighs only 18 pounds, including all accessories. Modern electronics — transistors and printed circuits — make it rugged to withstand the wear and tear on a portable instrument. Yet even with such durability and compactness, there has been no sacrifice in accuracy, dependability, and performance.

In addition to the portable model, Sanborn also offers the "100 Viso", a handsome desk-top ECG with two speeds, three recording sensitivities and provision for recording and monitoring other phenomena. Its mobile counterpart, the "100M Viso", is easily rolled to the patient's bedside in hospitals and clinics.

Ask your Sanborn Branch Office or Service Agency for complete information on the no-obligation 15-day trial period and convenient time payments. **Medical Division, SANBORN COMPANY, 175 Wyman St., Waltham 54, Mass.**

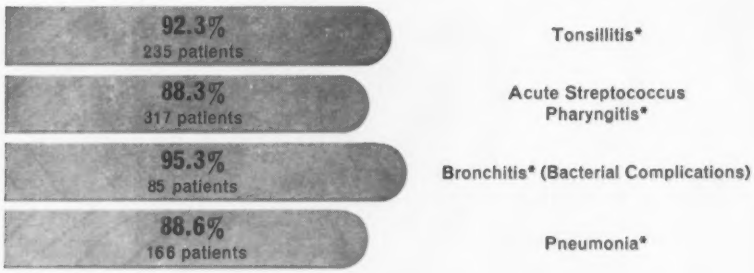
Sanborn service lasts long after the sale . . . from people who *know* your ECG and value *your* satisfaction.

when your tongue blade points to respiratory infection

Ilosone® works to speed recovery

Through the years, Ilosone has built an impressive record as an effective antibiotic in common bacterial respiratory infections. Numerous published clinical studies attest to excellent therapeutic response with Ilosone. Decisive recovery has become a matter of record.

Efficacy of propionyl erythromycin and its lauryl sulfate salt in 803 patients with common bacterial respiratory infections



*References supplied on request.

The usual dosage for infants and for children under twenty-five pounds is 5 mg. per pound every six hours; for children twenty-five to fifty pounds, 125 mg. every six hours.

For adults and for children over fifty pounds, the usual dosage is 250 mg. every six hours.

In more severe or deep-seated infections, these dosages may be doubled.

Ilosone is available in three convenient forms: Pulvules®—125 and 250 mg.†; Oral Suspension—125 mg.† per 5-cc. teaspoonful; and Drops—5 mg.† per drop, with dropper calibrated at 25 and 50 mg.

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Eli Lilly and Company, Indianapolis 6, Indiana

†Base equivalent
Ilosone® (propionyl erythromycin ester lauryl sulfate, Lilly)

132641

Lilly
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IMS

American Association of Railway Surgeons

Seventy-Third Annual Meeting

April, 1961 – Chicago, Illinois

The American Association of Railway Surgeons is the oldest medical organization the members of which serve an industry. In the same week in 1961 that the Industrial Medical Association was conducting its forty-sixth annual session in Los Angeles, the American Association of Railway Surgeons engaged in its seventy-third annual assembly in Chicago. Thus, in a just sense it may be recognized that A.A.R.S. is the sire or prototype of the now numerous medical associations in occupational health throughout the land.

In the fargone years the emphasis on the railway surgeons' activities was upon trauma and traumatic surgery. In the outstanding scientific program of the 1961 sessions, it is notable that of 20 major topics discussed, only five directly involve surgical operations. By no means does this indicate any waning in the significance of surgery. Rather this program reflects the growing awareness that the world of the railway surgeon is a much larger one than encompassed by the term "traumatic surgery."

For many years *Industrial Medicine and Surgery* has been the official publication organ of A.A.R.S., and this Journal finds pleasure in that distinction. As one service to the Railway Surgeons, this Journal presents this feature issue with its major contents devoted to the chief scientific addresses before the 1961 assembly.

The current President of A.A.R.S. is Dr. Chester C. Guy, Chief of Surgery, Illinois Central Railroad, Chicago Hospital, Chicago, Illinois. The Secretary of the Association is Dr. Carl Y. Werelius, Assoc. Chief of Surgery, Illinois Central Railroad, Chicago Hospital, Chicago, Illinois. All communications relative to the activities of the American Association of Railway Surgeons may be addressed to the Secretary, whose complete address is: 5800 Stony Island Avenue, Chicago 37, Illinois.

• MARK H. LEPPER, M.D.
Professor and Head of the
Department of Preventive Medicine
University of Illinois, Chicago

Two More Years with the Antibiotics

From the mail received, physicians may feel that the developmental pace of the early years of chemotherapy has continued. This, in my opinion, is much smoke and little fire. On the other hand, during the past two years continuing studies of the less dramatic type have resulted in data on which better documented recommendations and some new attitudes on the use of antibiotics may be based.

In Table I the available drugs are divided into groups by breadth of action and by toxicity. The latter is more important since in any given situation where two or more drugs work it is preferable to use the least toxic. Thus, the agents placed in group three are sufficiently more toxic than those in the other two groups that they should be used only when the diagnosis is established well enough bacteriologically, or clinically in life threatening situations, to serve as an indisputable indication. The breadth of action is relatively unimportant when making a decision with regard to patients with a well established diagnosis. Thus, if a patient is known to have tuberculosis it is irrelevant that isoniazid has no other favorable action besides its antituberculous effect, whereas a tetracycline has a wide range of usefulness albeit relatively little antituberculous effect. It is clear that isoniazid would be chosen for the specific purpose. The situation into which breadth of action usually enters is where an empiric choice of therapy is being made. It is a natural inclination when there are several possible diagnoses to use a drug that would be effective against all of them. In patients whose condition is rapidly deteriorating an attempt at broad empiric coverage is needed in spite of the difficulties that are introduced. On the other hand, there are several limitations which make this approach undesirable in less serious situations. Firstly, as seen in the subsequent tables, the efficacy of no one drug is greatest for several of the common infections. Secondly, if the diagnosis is still not confirmed when the patient is improved, one is faced with the necessity of treating for the duration indicated by the diagnostic possibility that requires the most treatment, or risk a relapse. Thirdly, since the diagnosis has not been secure any delay in response will inevitably lead to confusion at a time when the possibility of diagnosis has been greatly compromised. Fourthly, there is a marked tendency to stop empiric treatment as soon as the patient responds. This frequently leads to relapses and an unnecessary prolongation of morbidity.

It is also apparent in Table I that there are few new entries since 1959. There have been chemical analogues of several drugs introduced or further studied. Demethylchlortetracycline, for example, offers the possibility of a tetracycline treatment at a lower dose schedule. This difference does not fundamentally alter the indications or relative worth of the tetracycline

TABLE I.
GROUPING OF ANTIBIOTICS BY TOXICITY AND USEFULNESS

Range of Usefulness	Group I Least Toxic	Group II Toxicity Acceptable for Routine Use	Group III Reserved Because of Toxicity for Situations Where of Unique Benefit
Multiple Uses	Tetracyclines Erythromycin Oleandomycin	Penicillin Methicillin Sulfonamides Streptomycin	Chloramphenicol Kanamycin Neomycin Colimycin
Few Uses	Isoniazid	Nitrofurantoin Novobiocin Paraminosalycilic Acid	Polymyxin Vancomycin Ristocetin Bacitracin Amphotericin Cycloserine Viomycin Pyrazinamide Furaldadone

group and therefore has not been specifically tabulated. Oleandomycin, which is closely related to erythromycin and other macrolides, is sufficiently different to be listed separately, but it has not been extensively studied. Furaldadone, another of the furacin derivatives, has been disappointing since it has proved to be more toxic than nitrofurantoin and its efficacy has been so low that whether it even exists has been questioned. If there is an effect it seems to be extremely inconsistent; probably because antibacterial concentrations are rarely obtained in tissues.

Among the penicillins there has been a major breakthrough; the active nucleus of the molecule can now be obtained in large amounts and in a pure form. This has allowed synthesis of new analogues. One of these, phenethecillin, has favorable properties as far as absorption is concerned, but it is not different enough from penicillin G. or V. to list separately. It does, however, offer the possibility of relatively high dose prolonged penicillin therapy for treatment of some subacute or chronic conditions. It was discovered with phenethecillin that resistance to penicillinase could be altered by change in the molecule, and while it was not great enough to be of clinical significance with this analogue, others were sought. One of these, methicillin, has been specifically introduced for use in staphylococcus infection. Its use is limited by the fact that it cannot be used by mouth and that basically it is a somewhat less active compound; hence, a large dose is required. It is tabulated separately because of all of these differences. The last of the new drugs is colimycin. This substance, originally described in Japan, is a polymyxin-type drug. However its toxicity is low enough that its dose range has allowed it to be studied in a wide variety of situations.

The Drug of Choice

In Tables II, III, and IV are tabulated most of the infections encountered. For each of the infections an attempt has been made to pick as the best established the drug that has clear superiority or is the one with the best documentation of activity. The "best alternative" column lists the drugs that are less well tested and/or are somewhat inferior. The other three columns list drugs that may be tried even though they have not been tested sufficiently to indicate equal or superior activity; those that are frequently used because of past experience but now are known to be less reliable; and those of some efficacy but that are so toxic that their use in

TABLE II.
INFECTIONS THAT ARE TREATED WITH GREATEST SUCCESS

Infection or Organism	Agents That Are				
	Best Established	Best Alternatives	Potential Alternatives But Relatively Untested	Used But Inferior	Effective But More Toxic Alternatives
Streptococcus Pyogenes Group A.	Penicillin	Erythromycin	Oleandomycin	Sulfonamide Tetracycline	Chloramphenicol
Pneumococcus	Penicillin	Tetracyclines Erythromycin	Oleandomycin	Sulfonamides	Chloramphenicol
Gonococcus	Penicillin	Tetracyclines Streptomycin Erythromycin	Oleandomycin	Sulfonamides	Chloramphenicol Kanamycin Bacitracin
E. coli (Community acquired)	Tetracyclines Sulfonamides (Urinary principally)	Streptomycin (Urinary only) Nitrofurantoin	Colimycin	Polymyxin	Chloramphenicol Kanamycin Neomycin
Shigella	Tetracyclines	Sulfonamides	Colimycin	Streptomycin Kanamycin (orally) Neomycin (orally) Polymyxin (orally)	Chloramphenicol Kanamycin or Neomycin, both Parenterally
Hemophilus Influenzae	Tetracyclines	Chloramphenicol Streptomycin (+ Sulfonamides in severe)	Colimycin	Sulfonamides alone	Kanamycin Neomycin Polymyxin
Syphilis	Penicillin	Tetracyclines	Erythromycin Oleandomycin		Chloramphenicol
Rickettsial	Tetracyclines	Chloramphenicol	Erythromycin Oleandomycin		
Pasturella	Streptomycin	Tetracyclines		Sulfonamides	Chloramphenicol
Actinomycosis	Penicillin	Tetracyclines			Chloramphenicol
Blastomycosis	Amphotericin	Hydroxystillbamadine			
Lymphogranuloma	Tetracyclines			Penicillin	Chloramphenicol
Chancroid	Tetracyclines	Sulfonamides Streptomycin			Chloramphenicol

the specified infection should be restricted for some unique indication. For example, if a drug has considerable toxicity but is clearly superior therapeutically for a particular infection, it may be listed in column one for that infection, whereas for another disease in which it and a less toxic agent are equally effective it will be placed in column five.

Table II lists those infections that have been most successfully treated. This is an over-all estimate and, while some complications are more serious than the usual pathologic processes, these more difficult to treat situations are infrequent. Thus, pneumococcic infection in general can be treated successfully over 95% of the time, and even though pneumococcic meningitis is more difficult to treat, it occurs less than one time in 1,000 pneumococcic infections. The choice of which infections to place in each table was based on attempts to weigh the success of treatment of the various manifestations of the diseases as well as their frequency, and an over-all estimate of results. The infections in Table II are treatable over 90% of the time. There are a few changes in this table since the presentation of two years ago. The tetracyclines now appear to be somewhat less effective than penicillin in streptococcal disease and erythromycin seems to be the preferable alternative. Penicillin is still listed as the drug of choice in gonococcal infections although the concurrent presence of penicillinase producing staphylococci may compromise the results, as will the misdiagnosis of a Mimeae infection. This table includes the bacterial diseases that are most frequent and it is apparent that there are several excellent ways to treat each of them. Susceptibility tests are rarely needed and combinations of drugs are not needed.

The infections listed in Table III are those for which therapy is not as successful. There are certain manifestations of these diseases which may be treated as successfully as some conditions covered in Table II, but the frequency of the more difficult types is such that the over-all expected satisfactory response rate is between 60 and 90%. Much of the difficulty in treating infections in this group stems from the type of patient involved and the underlying disease process. They are frequently caused by more resistant forms which have become established in that environment.

Because of this, the first choice is not nearly as easily made and susceptibility tests are often needed. For example, in a staphylococcal infection that is caused by a strain not capable of forming penicillinase one of the older penicillins is undoubtedly the drug of choice. However, there is no way to know this other than by an accurate susceptibility determination. Similarly, among the common gram negative bacterial infections there are many drugs that will work well against certain strains but no one choice that can be recommended regularly without prior testing. It also can be seen that combinations of drugs are recommended in some of these conditions. However, the results with the recommended drugs are sufficiently good that one does not often have to resort to more toxic regimens.

In Table IV are listed those infections that are only occasionally treated successfully. The relative insusceptibility of the organisms, in addition to the nature of the patients involved and the pathologic processes, makes for a failure rate of 50% or more in this group. Therefore, sound use must be made of susceptibility tests to find potentially successful drugs or combinations that will have minimal toxicity. Since the treatment of these infections is often urgent, a first choice that is apt to be effective in the majority of instances has been listed, and little regard has been paid to toxicity.

New Trends in the Use of Antibiotics

Apart from the information tabulated, several trends that are pertinent have developed in the practice of medicine in the last two years. First is the continual upgrading of the facilities and supporting diagnostic methods that are available, and the second is the gradually changing knowledge of the nature of the diseases being treated.

Even since the introduction of chemotherapeutic agents there has been a wide dichotomy between the ideal way in which they should be used and the practical way in which they had to be used. Thus, it is clear that maximum benefit would result from treating only the patients in whom the drug would be effective, but being sure to treat all such patients at the earliest possible time. The best approach to this ideal is based on careful clinical examination, coupled with good laboratory support. The development of knowledge concerning the frequency of various etiologies of different clinical syndromes allows for a somewhat more accurate appraisal upon which drugs may be used empirically, both in the office and with critically ill patients in the hospital. However, the limitations of this method have become so evident that considerable effort has been made to make adequate bacteriological services available to the practitioner at all levels.

Many communities have developed programs to make streptococcal diagnostic services available, particularly through the efforts of the Heart Associations. More important is the fact that reliable media are now available from many

TABLE III.
INFECTIONS THAT ARE TREATED WITH INTERMEDIATE SUCCESS

Infection or Organism	Agents That Are				
	Best Established	Best Alternatives	Potential Alternatives But Relatively Untested	Used But Inferior	Effective But More Toxic Alternatives
Staphylococcus aureus (Community Acquired)	Penicillin or Methicillin* Erythromycin or Oleandomycin* plus Novobiocin	Tetracyclines		Sulfonamides Streptomycin Furaldazone	Chloramphenicol Kanamycin Neomycin Bacitracin Vancomycin Ristocetin
Streptococcus pyogenes, Group B, C, & G.	Penicillin	Erythromycin Tetracyclines	Oleandomycin Vancomycin Ristocetin	Sulfonamides	Chloramphenicol Bacitracin
Streptococcus viridens	Penicillin or Penicillin plus Streptomycin	Erythromycin and/or Tetracyclines	Oleandomycin		Bacitracin
Meningococcus	Sulfonamides or Sulfonamides plus Penicillin	Tetracyclines Penicillin	Erythromycin		Chloramphenicol
E. coli (Hospital Acquired)	Tetracyclines* Streptomycin and Sulfonamides* Chloramphenicol* Sulfonamides (Urinary principally*) Nitrofurantoin (Urinary only*)		Colimycin	Polymyxin	Neomycin* Kanamycin*
Klebsiella-Aerobacter (Community Acquired)	Tetracyclines* Streptomycin and Sulfonamides* Chloramphenicol* Sulfonamides (Urinary principally*) Nitrofurantoin (Urinary only*)		Colimycin	Polymyxin	Kanamycin* Neomycin
Typhoid Fever	Chloramphenicol		Colimycin Kanamycin	Tetracyclines	
Other Coliforms (Community Acquired)	Tetracyclines* Streptomycin and Sulfonamides* Chloramphenicol* Sulfonamides (Urinary principally*) Nitrofurantoin (Urinary only)		Colyimycin	Polymyxin	Kanamycin* Neomycin*
Brucella	Tetracyclines With or Without Streptomycin	Chloramphenicol With or Without Streptomycin		Sulfonamides Kanamycin	
Bacteroidies	Tetracyclines	Penicillin			Chloramphenicol
Anthrax	Penicillin	Tetracyclines Erythromycin			
C. diphtheria	Erythromycin	Penicillin Tetracyclines			
Listeria	Tetracyclines	Penicillin			Chloramphenicol
Erysipelothrix	Penicillin	Tetracyclines			
Tuberculosis	Isoniazid and Para-Aminosalycilic acid or Streptomycin	Streptomycin and Para-Aminosalycilic acid			Kanamycin Viomycin Cycloserine Pyrazinamide
Nocardia	Sulfonamides	Streptomycin Tetracyclines			Chloramphenicol
Histoplasmosis	Amphotericin				
Cryptococcosis	Amphotericin				
Amebiasis	Tetracyclines	Bacitracin (Orally)			
Psittacosis	Tetracyclines			Penicillin	Chloramphenicol
W. Fever	Tetracyclines	Chloramphenicol			

*Chosen by sensitivity test

laboratories in prepackaged sterilized and disposable forms for a relatively small cost. This development makes it feasible for any physician, with little effort, to perform the laboratory work needed to confirm his diagnosis. For those who prefer to use a hospital or commercial laboratory in the community, there are excellent transport media and sterilized swabs in glassine envelopes available for a small sum. It is likely that anyone wishing to base his antibiotic practice on a sound bacteriologic basis can now do so with little effort and at a price most patients can afford. In fact, over the years the patient will undoubtedly save money since the daily dose of antibiotics generally is more expensive than the laboratory procedures in question. Also, there is increasing evidence that the new technique of fluorescein antibody staining will allow early specific diagnoses to be made even more simply in many conditions. In those situations where etiologic diagnosis is implied from clinical data, such as scarlet fever or typical lobar pneumonia, even if cultures are not made at the start of treatment it is wise to keep a specimen of an appropriate secretion in the deep freeze of some refrigerator since this will allow study should the course not go as favorably as hoped.

In caring for the more seriously ill patient in the hospital, the documentation of the importance of organisms frequently considered to be of little significance in former years, such as Aerobacter Pseudomonas Proteus and Staphylococci, has

TABLE IV.
INFECTIONS IN WHICH TREATMENT IS DIFFICULT

Infection or Organism	Agents That Are				
	Best Established	Best Alternatives	Potential Alternatives But Relatively Untested	Used But Inferior	Effective But More Toxic Alternatives
Staphylococcus aureus (Hospital acquired)	Methicillin	Vancomycin Ristocetin Erythromycin + Novobiocin	Oleandomycin plus Novobiocin	Furaldadone Penicillin*	Erythromycin plus Chloramphenicol Bacitracin Kanamycin
Enterococcus	Penicillin plus Streptomycin	Ristocetin Vancomycin	Tetracyclines plus Erythromycin	Penicillin (Alone)	Penicillin plus Bacitracin Penicillin plus Kanamycin or Neomycin
Clostridium	Penicillin	Tetracyclines	Erythromycin		
Klebsiella aerobacter (Hospital acquired)	Kanamycin	Streptomycin plus Sulfonamides*	Colimycin	Tetracyclines* Chloramphenicol* Sulfonamides* (Urinary principally) Nitrofurantoin* (Urinary only)	Neomycin
Salmonella other than Typhoid	Chloramphenicol			Tetracyclines	Kanamycin Neomycin
Proteus species	Kanamycin	Streptomycin plus Sulfonamides*	Colimycin	Penicillin* Tetracyclines* Novobiocin* Sulfonamides* (Urinary principally) Nitrofurantoin* (Urinary only)	Neomycin Chloramphenicol*
Pseudomonas auruginosa	Colimycin or Polymyxin	Streptomycin plus Sulfonamides*		Tetracyclines* Kanamycin* Sulfonamides* (Urinary principally) Nitrofurantoin* (Urinary only)	
Other Coliforms (Hospital acquired)	Kanamycin	Streptomycin plus Sulfonamides* Tetracyclines* Chloramphenicol* Sulfonamides* (Urinary principally) Nitrofurantoin* (Urinary only)	Colimycin		Neomycin
Leptospirosis	Tetracyclines	Penicillin			
Candida	Amphotericin	Nystatin (Locally)			
Coccidioidomycosis	Amphotericin				
Other Fungi	Amphotericin				

*Chosen on the basis of susceptibility tests.

made laboratory control most important. Moreover, a much better empiric choice of therapy when required can be made, keeping the possibility of these infections in mind. Often knowing the organisms that are currently causing difficulty in the hospital and the usual susceptibility patterns will be invaluable in dealing with an acute emergency.

Information is available that allows a re-evaluation of susceptibility testing. As indicated in the tables, there are many situations in which this procedure is not needed. As a matter of fact, in many infections such as those caused by the pneumococcus, they may be misleading, because the organisms are uniformly susceptible to penicillin yet the error in the laboratory is such that up to 10% may be inaccurately reported. When the sensitivity tests are done it should be remembered that the results do not have the precision of many of the chemical tests one is accustomed to using. For this reason repeats should be done and careful attention should be paid to the species identification to see if the expected pattern is found. When susceptibility tests are crucial to guide exceptional therapy, such as combinations or high dosages, they should be done by the more reliable tube dilution methods.

Prolonged Prophylactic Therapy

Recent studies in the field of chronic infection of both the bronchial tract and the kidney have emphasized prolonged therapy of a prophylactic nature. This, coupled with the recent recommendations in tuberculosis, probably represents an expanding area of use for the antibiotics, namely prolonged use for continuous suppression of disease as previously done in the rheumatic fever patient.

In chronic bronchitis several studies have indicated that continuous tetracycline therapy can reduce the morbidity from acute exacerbations with relatively low toxicity. This may become accepted therapy for the more severely involved patients. To date there has been no evidence of amelioration of the basic pathologic state.

In the case of pyelonephritis, the recent revival of the technique of performing quantitative counts in the urine has allowed an accurate appraisal of the significance of asymptomatic bacteruria and provided a rationale for the prolonged treatment of persons with chronic bacteruria. This has been applied particularly successfully by Kass in pregnancy. Persons destined to have pyelonephritis have bacteruria early in pregnancy and the former can be prevented by treatment of the specific organism. Moreover, it has been shown that premature delivery is frequent in the bacteruric patient and that such a misfortune can be prevented with therapy of the infection.

A third indication for prolonged therapy that has been substantiated by data is in the case of young children who develop positive tuberculin tests. They can be prevented much serious tuberculous disease if they are treated at this early stage. This may well revolutionize practice from the point of view of necessity for routine tuberculin testing. It is also likely that the same principle will be applied to the high risk late teen age group and the geriatric patient with extensive presumably inactive disease that breaks down at the rate of about 3% per year.

Other patients on whom prolonged therapy is now used include children with fibrocystic disease and adults and children with hypogammaglobulinemia. It is most likely that the number of such indications will increase.

Summary

In the last two years there has been a consolidation of knowledge concerning the use of the antibiotics. It is possible to define somewhat more clearly the optimal drugs to use in many situations and to estimate the expected results. Tables illustrating this have been presented. The impact of modern technology in making better bacteriologic procedures available, including preprepared disposable media for use in office incubators and the fluorescein antibody techniques, should make the use of the chemotherapeutic agents much more scientific, and, more importantly, allow the provision of more nearly optimal treatment for the patients. Finally, the data supporting the contention that there is increasing emphasis on prolonged therapy of chronic infections often related to underlying chronic disease of other types is briefly reviewed.

The Status of the Tranquilizers

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Status is a relative thing rather than a quality; for instance, the status of the tranquilizers at this time is hardly what it was in 1955 and it may be even lower next year. Like virtue, drugs tend to lose status with age. In fact, to attempt to discuss these compounds today with the same enthusiasm that would have been possible in 1955 is a little like the man being ridden out of town on a rail who remarked, "Except for the honor of the thing I'd just as soon walk."

Before considering the drugs, let me briefly mention this tranquility which is being lost in epidemic proportions.

Tranquility is a state of calm, serene composure, free from disturbance and accompanied by wakefulness; it is a state more desirable in self than in one's employees. We hope tranquility, rather than confusion, will be our lot as we become aged. This same tranquility is not stressed so much in the young; rather they are taught to be anxious, competitive, and concerned. The only people who emphasize the blessings of tranquility in children are the "next door" neighbors.

This is more an anxious than a tranquil age. The tranquility of the first 50 years of life may be continuously interrupted by concern over the last 15. We all seek sufficient security to avoid worry over the uncertain and the unpredictable. This concern for the future provides a sustained market for the transitory tranquility these compounds provide.

It is worth noting that most people don't worry about the future until they have satisfied their needs for the present. If we eventually are able to assure everyone of a secure and comfortable old age (and of course burial insurance), the main concern again may relate to the Hereafter; and we will be faced with a shortage of churches, preachers, and pews.

Ever since man's repose after a full meal was disturbed by an awareness that he would shortly be hungry again, he has spent an increasing amount of his time preparing for his future needs. Although this foresight has certainly increased his comfort, it has also destroyed his tranquility; i.e., he can only eat one meal at a time regardless of how many he prepares. This capacity for future concern is so well developed in some people that the comforts of the present are destroyed by unceasing anticipation of future trouble. These people give status to the tranquilizers.

The condition that destroys tranquility is anxiety, which has been defined as fear without an object. The anxious may also evidence an excessive or unnatural fear of sickness, injury, or misfortune. Regardless of the particular worry the patient may have, the characteristic finding in anxiety is a morbid apprehension.

Luckily, by the time man had developed his capacity for worry, he had also found an antidote, alcohol. Primitive man found that alcohol would make him unconcerned, serene, and relaxed to the point of stupor. This finding has been confirmed repeatedly with each succeeding generation.

In addition to alcohol, there are three types of tranquilizers which may be grouped under the following headings: phenothiazine derivatives, rauwolfia alkaloids, and others. "Others" include the glycerol derivatives, the diphenylmethane derivatives and those compounds which are not chemically similar to the first two groups.

There are a number of phenothiazine compounds on the market. Unlike previously available sedatives, the phenothiazines do not produce ataxia, anesthesia, excitement, or a pronounced tendency to addiction. Chemically, they are composed of a phenothiazine nucleus to which side chains are added.

The chemical differences in these compounds are much more clearcut than their differences in effectiveness when given to patients. Clinically, the greatest variations between available phenothiazine derivatives are in their potency and in

the number of side effects they produce. It is generally agreed these drugs have no specific action in "curing" emotional illness; rather they tend to control symptoms and to decrease the patient's self-concern.

The most disturbing side effects they produce are leukopenia and jaundice. These complications are seen rarely; but if either occurs the drug should be discontinued permanently. Milder side effects which are frequently seen include excessive sedation, hypotension, dryness of the mouth, and extrapyramidal symptoms. One of the more unusual side effects is causing the virtuous to lactate.

Clinically, the most desirable of these products are those which are the most active and have the fewest number of side effects. It is preferable to prescribe a potent tranquilizer at a lower dosage rather than to use a large dose of an exceedingly mild drug.

The rauwolfia alkaloids have effects and side effects which are quite similar to the phenothiazines; but for some reason much of the earlier enthusiasm for these drugs in the treatment of the emotionally ill has waned.

A third group of tranquilizers are best termed skeletal muscle relaxants. Some of the older members of this group include mephenesin (Tolserol) and mephenesin-like compounds such as Ultran.

The best known of this older group is meprobamate which has the distinction of being the only one with two trade names, i.e., Equanil and Miltown, which possibly increased its potency on the market. In addition, meprobamate is available in combination with various other compounds.

For those who forget to take this compound during the day, there is a slow release form. These slow release capsules may also be opened and sprinkled over the morning cereal for reluctant but presumably "nervous" children.

More recent additions to the "relaxing" group of drugs include Librium (methaminodiazepoxide) and Listica (hydroxyphenamate). Both of these compounds are described as having few side effects and being well tolerated when administered over a prolonged period.

The tranquilizers are indicated for the excessively tense or "nervous" patient only if he is uncomfortable.

Summary

The tranquilizers' position as safe tension relieving drugs appears well established. They are nonspecific remedies that are effective in controlled symptoms. The phenothiazine derivatives and rauwolfia alkaloids are similar in effects and side-effects. Drugs in these two groups vary in potency and in toxicity.

The effectiveness of tranquilizers in the treatment of out patients is quite difficult to evaluate because of the subjective nature of the relief these compounds afford. The picture is further confused by the influence of suggestion and the self-limiting nature of anxiety in many patients. Consequently, when the tranquilizers are combined with other active drugs or when their absorption is delayed, it is even more difficult to establish which effects are due to the compound and which should be attributed to suggestion or spontaneous change.

In view of the large number of similar tranquilizing drugs that are available, the practitioner needs a source of brief, impartial information about these drugs. The annual volume of *New and Non-Official Drugs*, a publication of the American Medical Association, is such a source. The effects, toxicity and contraindications of each compound are briefly and unemotionally stated in this book.

Never before has the practitioner had such a variety of compounds to prescribe for the anxious patient. These are tense times and everyone is to be made calm. But it must be emphasized that the only time an energetic or "nervous" patient requires a tranquilizer is when he is uncomfortable. There is nothing pathological about the patient's enjoying hard work.

These preparations are frequently recommended for those who have symptoms for which no physical basis can be found. Before suggesting a tranquilizer for those with unexplained symptoms, the physician should first evaluate the salutary effects of the negative findings in the history, physical examination, and laboratory. Patients may fear they have various organic illnesses, and they may be too apprehensive to mention their concern; but the negative finding may be quite sufficient to relieve their anxiety. They should be given an opportunity to improve before a tranquilizer is prescribed.

The Problem of Anuria

Diagnosis and Treatment of Acute Renal Failure

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The surgeon who undertakes to direct the overall care of victims suffering from extensive trauma is often intimately involved in the diagnosis and treatment of anuria or oliguria. Acute renal failure in this situation carries with it a mortality of from 20 to 80%, and, in contrast with other forms of renal disease, the patient either dies or recovers from this disease without clinically evident or progressive renal insufficiency. Since renal failure in the seriously injured patient is often preventable, is occasionally reversible, and, when treated correctly, invariably responds with an "all or none" prognosis, the knowledge of proper management becomes essential.

Definition

Clinically, acute renal failure is evident by suppression of urinary excretion, either anuria or oliguria. The latter we define as a urine volume of less than 400 cc. in a 24 hour period. This is particularly significant when associated with the excretion of dilute or isosthenuric urine and progressive azotemia.

Etiology

The causes of renal failure are many. Those associated with extensive trauma, however, include crushing injuries, extensive soft tissue destruction, the transfusion of incompatible blood and, finally, shock due to blood loss and/or severe water and electrolyte depletion. Pathologically, the descriptive term, "lower nephron nephrosis," initially intended to describe a destructive lesion of the distal renal tubule, has been shown to be somewhat less than accurate. Microdissections of entire nephrons have shown necrotic lesions to be scattered throughout the entire unit, and, in recent years, the more inclusive term "acute tubular necrosis" has been substituted. These lesions differ microscopically from those produced by nephrotoxic substances, such as mercuric bichloride, and their distribution is similar to the lesions produced by renal anoxia. It becomes apparent, therefore, that the common denominator in the production of a "crush kidney" or "shock kidney" is renal ischemia or tubular anoxia. This finding serves to emphasize the importance of intelligent prevention of shock and dehydration as a means of preventing acute renal failure in the extensively wounded patient.

Early Treatment: Diagnois and Determination of Reversibility

The initial approach to the oliguric or anuric patient involves consideration of the reversibility of the lesion. This indicates prompt diagnosis of the underlying cause with an early aggressive attempt to reverse the situation, followed by careful, well thought out, intelligent management of irreversible acute tubular necrosis.

1. Urinary Obstruction: The first step in the diagnosis and treatment of oliguria or anuria involves catheterization of the urinary bladder. The volume of urine present is of utmost importance; frequently a severely ill patient with a blunted sensorium (resulting from associated cerebral damage or depressing narcotic medication) will have a greatly distended bladder but no urge to urinate. Simple catheterization often

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will resolve this situation rapidly. The presence of gross blood in the urine specimen may be the first sign of a silently extravasating bladder perforation. Moreover, thorough examination of the urine specimen may reveal the low or fixed specific gravity, casts, or heme crystals indicating direct renal damage.

If no urine is present in the bladder, ureteral catheterization should be carried out immediately. In our experience, the complete absence of urine in the bladder suggests ureteral obstruction, since most patients with acute tubular necrosis will be severely oliguric rather than totally anuric. Cystoscopy and ureteral catheterization can be performed with a minimal amount of trauma, under local anesthesia if desired, and, if no urine flow is obtained from the renal pelves, the diagnosis of acute renal failure is established. Retrograde pyelographic studies are unnecessary unless one elects to catheterize only one ureter. Our preference is for bilateral catheterization without the instillation of contrast media, as the latter has been shown to produce more extensive renal damage in the presence of acute renal failure. Catheterizing both ureters will obviate the occasional missed diagnosis where a patient has unilateral renal agenesis or hypoplasia compounded by contralateral ureteral obstruction. In such a situation, unilateral catheterization can be seriously misleading.

A newer method for the early differentiation of the causes of anuria or oliguria is the radioisotope renogram. This method, which involves the intravenous injection of a tracer dose of I_{131} labeled hippuran with scintillation counters placed over each kidney is an excellent test of renal function, and, if carried out in the first 48 hours, will differentiate acute ureteral obstruction from acute tubular necrosis. In our experience, using this method during the past two years, it has been extremely helpful and obviates the need for cystoscopy and ureteral catheterization in many of these patients.

2. Circulatory Insufficiency and Dehydration: Having ruled out obstructive uropathy, prompt consideration must be given to the reversible forms of oliguria. The most common of these we group together as forms of circulatory insufficiency and include oligemic shock, myocardial failure, and vascular failure. In general, the first two categories are manifested by hypotension and peripheral vasoconstriction. When blood has been or is being lost, the proper replacement, logically, is whole blood. If not readily available, plasma, Dextran or isotonic saline can be utilized until whole blood is obtained. In older patients, where it is frequently difficult to determine the relative importance of blood loss and/or myocardial failure, it is often helpful to measure venous and arterial pressures simultaneously during blood transfusion. If the venous pressure rises before the arterial pressure, myocardial failure should be suspected and appropriate measures instituted. If neither venous nor arterial pressure rises with the infusion of large amounts of blood, one must suspect the presence of a hidden source of bleeding such as hemorrhage into the gastrointestinal tract or retroperitoneal space.

Hypotension, which is often seen in bacteremic shock, is occasionally associated with a lack of peripheral vasoconstriction which is evidenced clinically by warm extremities. This situation may be loosely classified as vascular failure, and is the classic indication for the use of vasopressor substances (Neo-Synephrine, Aramine, Wyamine) and/or adrenocorticosteroids, such as hydrocortisone. The use of these substances is probably not wise in the treatment of the oligemic hypotension resulting from blood loss where marked peripheral vasoconstriction is already present. In this condition, further renal vasoconstriction may actually result in decreased renal blood flow, predisposing the very condition we are attempting to correct.

The diagnosis and treatment of severe dehydration is probably the most complex aspect of acute renal failure. Dehydration may be suspected when the bladder urine is found to have a high specific gravity. Initial history and clinical signs of dry skin, dry axillae, soft eyeballs, and parched tongue may be corroboratory evidence. Finally, an elevation in hematocrit or total protein will often suggest marked hemoconcentration. Since clinical evidence of dehydration depends upon a loss of at least 10% of total body water, and frequently approaches a 20% loss, this figure may be used as a basis for initial fluid replacement. Pure water loss, without concomitant electrolyte depletion, is fairly uncommon, and, hence, an historical account of gastrointestinal losses, substantiated, in part, by determination of serum sodium, potassium chloride and carbon dioxide, should form the basis for replacement of these ions in conjunction with water replacement. Our usual approach is to estimate water loss on a basis of body weight and total body water; calculate electrolyte deficit from serum concentration, and then give approximately one third to one half the calculated deficit over an eight to 12 hour period. If urine flow is resumed, the remainder of the calculated deficit is infused slowly and the further treatment is carried out accordingly. If urine flow does not return with this replacement, the subsequent course must then be that of treating established renal failure as outlined below.

The radioisotope renogram may also be helpful in the diagnosis of acute dehydration, and, in our experience, the tracings obtained after dehydration of approximately one third of the calculated deficit will indicate this diagnosis.

3. Intravascular Hemolysis: Hemoglobinuria, bilirubinemia, and the presence of heme casts in the urine suggest intravascular hemolysis, often the result of incompatible blood transfusion or accidental infusion of distilled water. The time honored treatment of this condition has been alkalinization of the urine. The rationale for this therapy was based upon the solubility of free hemoglobin pigment (acid hematin) in an alkaline solution. Unfortunately, however, obstruction of renal tubules by heme casts is probably not the cause of renal damage, and a more significant factor is probably the agglutination of red cells in the terminal renal arterioles, producing tubular ischemia. Alkalinization of the urine, therefore, would seem to have little effect on the reversal of this arterial obstruction. Moreover, this treatment presupposes the ability of the kidney to secrete urine. If total anuria is present, obviously the addition of a large alkaline load may result in eventual pulmonary edema or tetany later in the course of the disease. Nevertheless, when a hemolytic episode is suspected, we often give not more than 5 gms. of either sodium bicarbonate or lactate as a rapid infusion.

In practically every experimental attempt to produce renal damage by infusing large amounts of free hemoglobin, methemoglobin or acid hematin, investigators have encountered difficulty unless dehydration, salt depletion, or renal ischemia preceded the addition of the toxic substance. Hence, it is probably of greater significance in the treatment of hemolytic episodes to direct our efforts toward the correction of dehydration, salt depletion and oligemia.

Treatment of the Oliguric Phase

If the above outlined attempts at prevention or reversal of the underlying cause of renal failure prove to be of no avail, the ensuing treatment consists primarily of sustaining life until such time as renal function returns. Further attempts to modify the renal lesion itself, such as spinal anesthesia or renal decapsulation, have not stood the test of time, and, in most instances, do more harm than good.

The seriousness of renal failure depends primarily upon the loss of two important functions of the kidney: regulation of water and electrolyte balance and the excretion of the products of cellular catabolism. The over-all treatment, therefore, is directed toward assiduous control of extracellular fluid and electrolyte concentration as well as the prevention or limitation of protein catabolism. The latter probably is the more important, since protein catabolism results not only in accumulation of nitrogenous substances (as well as sulfates and phosphates), but, most significantly, is accompanied by the release of large amounts of cellular potassium. Potassium intoxication is the greatest threat to life in acute renal failure, and accounts for the largest number of deaths in patients whose renal damage follows extensive trauma.

1. Water Balance: The maintenance of proper fluid balance depends upon extremely accurate measurement and/or estimation of daily fluid losses. The more overt forms of fluid loss, such as vomiting, tube drainage, diarrhea and urinary output, can easily be measured and recorded. The more subtle, "insensible water loss," however, can only be intelligently estimated. This we estimate, starting with a baseline figure of 0.5 cc. per kilogram of body weight per hour, and revise upward in the face of elevated atmospheric temperature, a spiking type of body temperature or a low relative humidity. From this baseline daily figure, which is about 1000 cc. for the average 70 kilogram man, is subtracted the water resulting from oxidation of body fat, protein, and carbohydrate. The deduction of this "preformed water" or "water of oxidation" lowers the daily requirement to about 400 cc. to which is added the volume recorded from overt losses. Since these calculations are often little more than judicious estimates, the necessity for accurate measurements of daily body weight becomes apparent. Daily weighing is mandatory in the treatment of the anuric patient and must be accomplished in spite of any nursing inconvenience. Fortunately, simple and accurate scales for the weighing of bedridden patients are readily available. If proper fluid regulation is carried out, the anuric patient will lose one half to one pound each day. It is not enough to maintain a constant body weight, as these patients will almost certainly be overhydrated or develop pulmonary edema if anuria persists more than a week.

2. Electrolyte Replacement: In addition to the usual elevation of blood urea or nonprotein-nitrogen and serum potassium, the most common electrolyte abnormality noted during the course of acute renal failure is a low serum sodium and chloride. For the most part, this is a reflection of initial overhydration and represents a dilutional effect. Attempts to raise these levels by the administration of saline are often disastrous, and, as a rule, the most efficacious treatment consists of more vigorous water restriction. When gastrointestinal losses are present, these should be replaced by equal volumes of fluid; the sodium and chloride content of the

replacement fluid being dependent upon the source of the losses. Obviously, solutions containing potassium are not used in this replacement.

Attempts to correct acidosis (as manifest by a low CO_2 content or combining power) are similarly often ill advised. Lowering of CO_2 content is merely a compensatory mechanism for maintaining the blood pH in the face of a rise in fixed acid metabolites. Attempts to "raise the CO_2" by the addition of alkaline salts, such as sodium bicarbonate or lactate, frequently result in two major complications: First, ionized calcium which is already depressed by the markedly elevated serum phosphate content is often rapidly lowered by alkalinization with the shocking precipitation of severe tetany. Second, the infusion of alkaline sodium solutions may provide just enough excess sodium to produce pulmonary edema. Being aware of the above, one should be content with a CO_2 in the range of 12 to 15 meqs. per liter.

3. Caloric Replacement: The provision of nonprotein calories is essential for diminishing catabolism of body protein which, as noted above, results in liberation of acid metabolites, nitrogenous moities, and, most important, potassium. Concentrated glucose is useful in this situation, not only for its protein-sparing effect but also for the prevention of ketosis resulting from incomplete oxidation of body fat. The minimum requirement for the prevention of ketosis is about 100 gms. of glucose per day, and, when possible, larger amounts are given. Administration of this carbohydrate is often difficult by the oral route due to the attendant gastrointestinal difficulty, and, for this reason, we generally give at least the daily requirement intravenously. This is usually administered through an indwelling plastic venous catheter as a 20 or 50% glucose solution. The concentration depends upon the total amount of fluid to be administered; for example, using a 50% glucose solution, as much as 200 gms. may be given in only 400 cc. of water. A small amount of heparin is added to the bottle and the infusion given over a 24 hour period, enhancing the protein-sparing effect of the glucose. To this we add a standard vitamin B and C supplement. As a rule, all fluids, electrolytes, and calories are best given intravenously, particularly during the early stages of renal failure. Surprisingly, patients tolerate a nothing-by-mouth regimen better than they do frequent, small, limited oral feedings. To promote oral hygiene, as well as serve as a further source of calories, we encourage the use of artificially-flavored hard candy of the fruit-ball variety.

4. Additional General Care: Several points in the general care of the anuric patient are worth reiterating. As noted above, early urethral catheterization is essential in the diagnosis of acute renal failure. Once the diagnosis has been made, however, the use of an indwelling catheter for the sole purpose of measuring urine output can only be condemned. Unless the patient is unable to void or is incontinent, there is no need for permanent catheter drainage. Most anuric patients will void when the bladder is full, often only once daily, and such a daily measurement of urine output is more than sufficient for calculation of replacement. An unnecessary urethral catheter is merely a potential source of infection in a patient whose resistance to infection is invariably lowered.

The use of antibiotics in the anuric patient poses several problems. Infection, with its attendant increase in protein catabolism, is a serious hazard, and, when indicated, aggressive antibiotic treatment must be instituted. The use of prophylactic antibiotics, however, leads to the well known problems of late bacterial resistance, and nothing is more distressing to the surgeon than to maintain a patient throughout the course of renal failure only to have him develop a fulminating septicemia when in the diuretic phase. If antibiotics are used, the pharmacologic breakdown of the individual drug must be well understood, as some drugs (e.g. Streptomycin) are excreted by the kidney and toxic levels are rapidly reached in the anuric patient. The loss of renal excretory function must also be remembered when using analgesics and sedatives. If barbiturates are given, the short acting preparations, which are metabolized by the liver, should be utilized rather than the longer acting drugs which are normally excreted by the kidney.

5. Potassium Intoxication: The two major hazards of acute renal failure are pulmonary edema and potassium intoxication. The former may be prevented by the judicious control of fluid administration. Control of potassium liberation, however, is more difficult, particularly in the severely injured or traumatized patient. Extensive tissue damage, infection and the administration of large amounts of bank blood all result in release of potassium into the extracellular space from which it cannot be excreted. Hence, the patient who develops renal failure following extensive trauma is an ideal candidate for early potassium intoxication, and clinical observation must be directed toward the early recognition of this complication. Unfortunately, serum potassium levels, though helpful, are not a direct indication of the lethal effect of hyperpotassemia; namely, the cellular concentration. Since death results from disturbance in myocardial conduction, the best standard for measuring impending potassium toxicity is the electrocardiogram.

Tracings should be obtained at least daily and the changes followed in a specific lead, such as a V_2 precordial lead. Clinically, the earliest manifestations of potassium intoxication are sensations of tingling about the lips, numbness of the extremities and diminution of activity of the deep tendon reflexes. These we elicit and record daily.

Several therapeutic adjuncts are available to minimize or control potassium intoxication. These adjuncts, for the most part, are only temporary and partially effective, and, once this complication becomes evident, the patient must be considered for hemodialysis by the artificial kidney. Hydrogen or sodium loaded cation exchange resins, administered rectally, will remove about 1 meq. of potassium per gram of resin. Approximately 50 gms. of the resin is administered in 200 cc. of water as an enema once or twice daily when indicated. The addition of crystallin insulin to 50% glucose in a dose of one unit for three grams of glucose with a rapid infusion of about 200 cc. in half an hour will often produce significant clinical and electrocardiographic improvement which may last six to eight hours. Similarly, the ionic antagonism of sodium to potassium may be utilized by the rapid infusion of hypertonic saline when severe toxicity is present. The infusion of 200 cc. of 3% saline is attended by rapid improvement which may be maintained for several hours. These measures are particularly helpful in providing the time necessary for transfer of a patient or the preparation of an artificial kidney team.

The ultimate treatment, then, involves extracorporeal hemodialysis with the artificial kidney. The newer modifications, such as the disposable twincoil dialyzer, are practical and effective and readily available in most major medical centers. Peritoneal dialysis is a simple method for the removal of smaller amounts of potassium, and may, in certain selected cases, prevent the need for extracorporeal hemodialysis. It must be emphasized, however, that many patients with acute renal failure can be maintained by intelligent and conservative means as described above, and the artificial kidney is merely an adjunct to good medical care.

The Diuretic Phase

The duration of anuria in acute renal failure is unpredictable. Diuresis may begin during the first week, but is often delayed as long as three weeks. The persistence of anuria beyond the third week is a grave sign and generally indicates severe irreversible renal damage. The importance of continued careful management during the period when the patient begins to elaborate urine is attested by the number of patients who die during this diuretic stage (about 25%). Many of these deaths are attributable either to the underlying original disease, infection, or injudicious care during the oliguric phase, but many are the result of the physician relaxing his close control of the physiologic balance. Renal excretion of metabolites in the first few days of diuresis is often inadequate, and over administration of electrolytes as well as water and protein may disrupt a well established equilibrium. Frequently, the blood urea nitrogen continues to rise during the early diuretic phase. This should not be a source of concern, since the phenomenon represents inadequate clearance of solute in the presence of increased volumes of urine. Once diuresis is well established, it is our practice to allow the patient to determine food and fluid intake on an ad lib basis. Patients who are hungry and thirsty will not eat themselves into severe uremia or drink themselves into pulmonary edema, once the diuretic phase is underway.

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The Diagnosis and Treatment of Venous Thrombosis

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During the past few decades, we have learned from clinical and laboratory studies that many of the serious complications of extensive trauma to the human body can be prevented by early and effective treatment. We are now able to combat traumatic shock by the rapid restoration of the blood volume of the victim by the use of blood plasma and plasma expanders, we are able to prevent death from massive hemorrhage by supplying large quantities of properly matched and preserved human blood, and we are able to combat spreading microbial infection by the intensive use of the proper antibiotic agents. In spite of all this progress, however, the problem of peripheral venous thrombosis, with its serious immediate consequences and the resulting long term disability, still remains of greatest concern to most surgeons, and particularly to those of us who must deal with severely traumatized human beings.

It is therefore timely to renew our knowledge of the process of intravascular clotting of blood and to re-evaluate our ways of recognizing venous thrombosis early and preventing its serious consequences.

Abnormal clotting of blood within peripheral veins may lead to many serious complications, ranging from sudden and unexpected death to development of persistent pain, swelling, induration, and even ulceration of an extremity.

Diagnosis of Venous Thrombosis

The superficial type of venous thrombosis is easily recognized by the localized signs of the chemical inflammatory reaction and the underlying cord-like thickening of the saphenous vein or of a large varix. However, the recognition of the presence of venous thrombosis in the deep veins during its formative stages may be extremely difficult. Long clinical experience has netted us only three signs which may be considered as suggestive of deep venous thrombosis in its early stages. The *first sign* is deep pain, often in the entire lower extremity, which persists for hours or days and which is not relieved by change of position of the extremities or by mild analgesic medicaments. The pain usually is made worse by walking or by placing the extremity in the pendent position. The *second sign* is severe sharp pain in the calf muscles of the leg when they are gently squeezed by the hand. The maneuver of gently squeezing the calf muscles twice each day of all patients who are confined to bed should be religiously carried out if the deep venous thrombosis in the legs is to be detected in its early stages. Finally, the *third sign*, although by no means a pathognomonic one, should arouse the physician or surgeon to a more careful search. This sign is persistent elevation of the pulse rate in the vicinity of 100 beats per minute following delivery, operation, or confinement to bed, particularly when there are no other reasons for the mild tachycardia.

These are important signs pointing toward obscure deep venous thrombosis and should alert the surgeon to the dangers that lie in the immediate future. Effective therapy with Heparin should be instituted before the diagnosis becomes clinically obvious. Often massive pulmonary embolism takes place before the diagnosis of deep venous thrombosis has been made.

The physicochemical changes in the blood

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which initiate venous thrombosis do not differ greatly from those incident to the normal process of coagulation of blood. Effective therapy must, therefore, be directed toward the pathologicophysiologic changes that are responsible for the extension of such intravascular blood clots.

Quick[1] believes that an injury to the vascular wall, even though it is very slight, may produce a rough surface on the intima to which platelets can adhere. As these platelets disintegrate, they produce thrombin which initiates the local formation of the thrombus or clot. The primary thrombus then contracts and squeezes out serum that is rich with nascent thrombin. If the local circulation is slowed, this serum will not be washed away promptly and this will favor the formation of a secondary thrombus upon the original clot. When this addition to the fibrin coagulum begins to retract, it again initiates further growth of the thrombus. Retraction of the thrombus not only explains the propagation of the clot but also accounts for its nonattachment to the wall of the vein except at the site of origin. Any therapeutic agent that will diminish or retard the retraction of the clot should be valuable in the management of peripheral venous thrombosis.

The important problems for the clinician, however, center around the prevention of the formation of blood clots within peripheral veins. Or, if they have already formed, his concern is how they may be prevented from being extended or transported to vital parts of the body. The early recognition of the localized peripheral venous thrombosis is therefore essential to effective therapy.

Prophylaxis of Venous Thrombosis

The correction of anemia is particularly important because the retractability of the clot, which is the main factor in liberating thrombin to cause more thrombus formation, has been found to be greater when the blood cell volume is lowered. Stagnation of blood in the various venous plexuses of the body favors the formation of intravascular thrombosis. There are many factors which influence the return of blood to the heart from the various peripheral portions of the body. The maintenance of normal negative pressure within the abdomen and thorax, and the elimination of all forms of mechanical obstruction to the return flow of blood are important factors. The muscles of the calf region are pressed against the mattress when the patient is lying in bed and there is abnormal pressure over the adductor regions when thighs press together sufficiently to cause a retardation of the return flow of blood into the intra-abdominal veins. It would be poor clinical judgment to give active treatment for a weak heart muscle and at the same time overlook fluid collections in the pleural and peritoneal cavities, to fail to relieve abdominal distention from any cause, to neglect to instruct the patient to breathe deeply at regular intervals, or to allow feet to become cold or remain in the pendent position for long periods of time. The contractions of the muscles of the extremities are necessary to maintain normal flow of venous blood from the legs to the heart.

Early Ambulation: The early ambulation of patients, even after major abdominal operations, is an important prophylactic measure against venous thrombosis. Abdominal incisions should be carefully brought together by sutures so the patients can start walking on the day after, or in many instances on the day of, the operation. To delay ambulation until the third or fourth day after a major surgical operation is dangerous, since blood clots which formed in peripheral venous plexuses during the first three or four days of relative immobilization could then be dislodged and carried to the lungs as emboli. Early ambulation means that the patient must be made to walk and not just be allowed to sit on the side of the bed with the feet in the pendent position. Venous thrombosis, however, may occur in patients who have not been confined to bed by illness or operation.

Resting Position: For those patients who cannot be mobilized early in the course of their illness, we recommend the elevation of the foot of the bed by a chair or wooden blocks, with special care to elevate the pelvis above the level of the heart. Under no circumstances should the knees be flexed by raising the center of the bed or by placing pillows under them. This position favors stagnation of blood in the venous plexuses of the leg and in the pelvis. Regular active motion of the extremities must be insisted upon except when there is spreading infection in the extremities or when myocardial damage contraindicates any active motion of the body.

Compression Bandages: In patients who have large varices of the legs or in those who have clinical evidence of venous stasis in the distal parts of an extremity on standing, elastic bandages should be applied from the base of the toes to the groin before operation or other confining illness. Keeping these bandages in place until the patient can move the extremities actively will reduce the incidence of peripheral venous thrombosis. Care must be taken not to apply the elastic bandage too tightly, for mild compression of the superficial veins is all that is needed to prevent stagnation of blood in the subcutaneous venous plexuses.

Treatment of Venous Thrombosis

The clinical manifestations of the various stages of venous thrombosis vary greatly. After thrombosis of the peripheral veins has once taken place, the important therapeutic objectives are (1) to limit the propagation of the thrombus; (2) to overcome the local derangement of the venous and arterial circulations of the affected extremity; (3) to block the transportation of fragments of clots to vital parts of the body; (4) to prevent recurrent attacks of localized venous thrombosis.

Limiting the Propagation of the Thrombus: If the venous thrombosis is definitely superficial and well localized below the knee, local application of moist heat or cold is acceptable treatment; but if any signs of ascending venous thrombosis become apparent, then we believe that high ligation of the affected vein, with excision of the thrombosed portion of the superficial venous system, will greatly reduce the period of disability and reduce the incidence of complications.

Patients with sudden severe deep venous thrombosis should have the extremity protected immediately from all forms of external trauma. The skin should be gently greased with lanolin, then covered with cotton wadding. Under no circumstances should the tissues of the extremity be massaged or moved, actively or passively, during the acute phase of the venous thrombosis.

The most important of the conservative measures of therapy of deep venous thrombosis is the modification of the clotting tendency of the blood. Elevation of the involved extremity, with absolute bed rest during the initial period of therapy with anticoagulants, is important. The coagulation time (Lee-White method) and prothrombin concentration (Quick method) in peripheral venous blood should be determined as soon as the venous thrombosis is detected. If the values are within normal limits, Heparin and Dicumarol should be administered simultaneously. Some patients have shown an unusual sensitivity to anticoagulants, both Heparin and the coumarins; consequently, these drugs must be used with caution.

Heparin (Antithrombotic Agents): Heparin is a hormone that is normally produced in the human body, coming closest to being the ideal anticoagulant (antithrombin) for human beings. It prevents propagation of a thrombus and permits the establishment of a collateral venous circulation by maintaining the patency of collateral venous channels. The cost of Heparin has prevented its universal or more extensive use.

We prefer to use Heparin in one of three ways. The intermittent intravenous injection of 50 to 100 mg. dissolved in 100 cc. of isotonic sodium chloride solution may be given every 3 to 4 hours. Sufficient Heparin should be given to keep the clotting time at two to three times the normal value (Lee-White test). The use of polyethylene plastic tubing simplifies the intermittent intravenous administration of Heparin. This method[2] consists of the insertion of a 17-gauge needle with stylet into the antecubital vein. The stylet is withdrawn and the polyethylene tube is threaded through the needle into the lumen of the vein. The needle is withdrawn and the polyethylene tubing is anchored to the skin with adhesive tape. The site of perforation of the skin should be protected by a small piece of sterile gauze. A 22-gauge needle with Luer-lock and rubber stopper attachment is inserted into the lumen from the free end of the polyethylene tube. The air is removed from the rubber stopper attachment and Heparin is injected by means of an ordinary hypodermic needle and syringe. This method of administration of Heparin works well for four or five days, which usually is sufficient because the anticoagulant effect of the coumarins is then manifest, even when the first therapeutic dose has been delayed for one or two days.

The intramuscular administration of aqueous Heparin solution is valuable when anticoagulant therapy is necessary for only about one week. The usual therapeutic dose[3] is 75 to 100 mg. intramuscularly every eight hours. Total dose for 24 hours should not exceed 0.45 gm. We use the concentrated solution of Heparin (0.1 gm. to 1 cc.). The dose should be regulated so that the clotting time of the blood will be two to three times the normal value (normal coagulation time 9 to 15 minutes, Lee-White modification of Howell's method). Concentrated solutions of Heparin are most valuable in maintaining an elevated coagulation time after a therapeutic level has been established by an initial intravenous injection of 50 to 100 mg. of Heparin. Hematomas at the site of injection can be avoided by depositing the Heparin deep in the gluteal muscles.

The intramuscular injection of slow-acting Heparin mixtures has made the treatment with Heparin more convenient. Heparin in a medium of gelatin and glucose (Pitkin's menstruum) is slowly absorbed so that 0.3 to 0.4 gm. of Heparin may be given at one injection and the prolongation of the clotting time at the therapeutic level will continue for 36 to 48 hours. These injections have produced pain and local aching at the site of injection. To eliminate these discomforts, we use the improved preparation of Heparin in gelatin called Depo-Heparin. It has the same therapeutic effect as Heparin in Pitkin's menstruum. It is prepared in two forms, plain and

with a vasoconstrictor drug added. This product has the advantage of being painless on injection and the concentration of Heparin has been increased to 0.2 gm. for each cc. of the mixture. The dose is 0.4 gm. every other day; 0.2 gm. plain or 0.2 gm. with a vasoconstrictor drug. Vasopressor drugs should not be used in patients with extensive arteriosclerosis or arterial hypertension. The duration of the effect of plain Depo-Heparin is relatively short; consequently, a daily dose of 0.2 gm. is necessary to keep the clotting time at the therapeutic level between 10 and 18 hours after the injection.

Coumarin Anticoagulants (Dicumarol and its Analogues: Warfarin and Phenylindanedione): Dicumarol has the advantage of being effective after oral administration and it is inexpensive; consequently, it has been widely used. It has, however, many disadvantages, such as delayed action, extreme variability of effect, and the fact that it requires frequent determination of prothrombin activity. Its use is limited by the hazard of hemorrhage, especially in surgical patients. Diabetic patients are often sensitive to Dicumarol and it should never be used in patients with hepatic or renal diseases, patients with granulating wounds or open ulcers, or in patients with hemorrhagic blood diseases. Unless the prothrombin activity is kept in the vicinity of 20% of normal, the treatment may not be effective in controlling intravascular thrombosis.

Dicumarol therapy is not begun until the prothrombin level in the peripheral blood has been determined and found to be normal. We give an initial dose of 300 mg., followed by 100 to 200 mg. on the second day, and then 50 to 100 mg. daily. It is extremely important that the prothrombin time be determined daily before the administration of more Dicumarol. The dose of the drug must be determined by the effect of previous doses upon the prothrombin time.

When Heparin and Dicumarol are used simultaneously, a more rapid effect upon the clotting mechanisms results than when Dicumarol is used alone. When the prothrombin activity has fallen to 20% of normal or below, Heparin should be discontinued and the anticoagulant therapy carried on by Dicumarol alone.

The sensitivity of the patient to Heparin should be determined by injecting about 4 mg. of the drug intravenously and studying the effect on the clotting time, before proceeding with the administration of the therapeutic dose. Abnormal sensitivity to Dicumarol should be suspected if excessive prolongation of the prothrombin time results within 24 hours after the initial dose of the drug. Care must be exercised in administering more Dicumarol in such patients until the full effect of the antiprothrombin activity has been accurately determined by dependable laboratory tests. Occasionally in patients under Dicumarol therapy there is a marked but temporary increase in the prothrombin time within three hours after the intravenous injection of one therapeutic dose of Heparin. McGuire and his associates have observed this phenomenon and state that it has been alarming to the physicians but apparently not harmful to the patients.[4]

When Heparin is suddenly withdrawn after several days, there is a noticeable increase in the coagulability of the blood, and when Dicumarol is suddenly discontinued the prothrombin concentration has been observed to rise so sharply that secondary venous thrombosis may take place in other parts of the body. We have observed this phenomenon many times and have revised our treatment so that the anticoagulants are gradually withdrawn. The active treatment with Dicumarol should be carried on at least 14 days, and then slowly withdrawn over a period of another two or three weeks. Ambulation should be permitted only after all local signs of venous thrombosis have subsided but while the anticoagulants are still being administered.

Severe, even fatal, hemorrhage has been reported after the use of anticoagulants. We have used anticoagulants as prophylaxis against venous thrombosis only rarely because of the increased danger of hemorrhage in those patients who do not show evidence of increased coagulability of the blood. In our hands, the administration of anticoagulants has proved to be a valuable means of limiting the extension of deep venous thrombosis in the extremities.

Antidotes for Anticoagulants: The effect of Heparin can be neutralized immediately by the intravenous administration of protamine sulfate. Protamine sulfate solution (1 cc. of the 1% solution) will neutralize at least 15 mg. of crystalline Heparin.

Since the introduction of Dicumarol and similar antiprothrombic agents, there has been a need for an agent that would counteract rapidly the excessive hypoprothrombinemia that may result from the use of these drugs. Water soluble preparations of vitamin K have, at times, been less effective in correcting this hypoprothrombinemia due to Dicumarol than the less soluble forms of vitamin K_1 and K_1 oxide. This apparent inconsistency may be partially explained by the recent studies correlating plasma Dicumarol concentration with prothrombin time. Two different mechanisms are involved and each may respond differently to the administration of vitamin K. Plasma levels of Dicumarol may vary widely in different persons after the same oral dose of

Dicumarol, because of differences in rate of absorption and metabolism. There is also a variation in the degree of hypoprothrombinemia which may develop in response to a given plasma level of Dicumarol. Excessive hypoprothrombinemia may, therefore, result from an accumulation of the drug or from an abnormal sensitivity of the regulating mechanisms to low plasma concentration of Dicumarol. If the excessive hypoprothrombinemia is the result of abnormal sensitivity to low plasma concentrations of Dicumarol, then a single large dose of water-soluble vitamin K (40 to 60 mg. of menadione bisulfite) may overcome the difficulty; but if there is an abnormal accumulation of Dicumarol in the plasma, then repeated and large doses of vitamin K may be necessary. The rate of disappearance of Dicumarol from the plasma is not altered but large doses of vitamin K may overcome the competition in prothrombin formation that exists between Dicumarol and vitamin K. When the plasma Dicumarol levels remain high, a more prompt, as well as more sustained, effect may be expected from the oral administration of 1 gm. of insoluble vitamin K_1 or the intravenous administration of weak alcoholic solutions of K_1 oxide.[5]

Local Derangements of the Circulation: Elevation of the extremity is the most effective means of reducing the edema of the tissues in patients with peripheral venous thrombosis. The high protein content of the lymphatic fluid in the extremity of these patients with nodular thrombophlebitis makes it essential to keep the swelling at a minimal level lest the fluid clots and the resulting cellular reaction produces irreparable changes in the tissues by fibrous tissue infiltration.

Anesthetization of Regional Sympathetic Ganglia: Proper anesthetization of these sympathetic ganglia by 2% novocain usually will relieve pain, reduce the edema of the part, and overcome the secondary vasospasm in the affected extremity. This should *not* be done while the patient is under treatment with anticoagulants because of the danger of deep hemorrhage. The beneficial effects of this simple therapeutic procedure in the chronic phase of iliofemoral thrombophlebitis which has caused considerable chronic swelling and severe neuritic pain have been striking in some patients. The period of disability from chronic iliofemoral thrombophlebitis usually can be shortened by repeated anesthetization of the regional sympathetic ganglia, using 5 to 10 cc. of 2% novocain for each ganglion and repeating the injection every day for four or five days.

Prevention of Transportation of Fragments of Clot: In all cases of acute ascending venous thrombosis in the great saphenous veins of the thigh, these veins should be ligated and divided at their junction with the femoral veins before the process of thrombosis ascends to that level. Such superficial venous thrombosis may ascend progressively and may enter the common femoral vein and produce signs of deep venous occlusion. In the chronic forms of thrombophlebitis where the common femoral vein has previously been occluded, the added danger from ascending thrombosis in the great saphenous vein is then slight.

Superficial venous thrombosis (saphenous systems) is painful and disabling but usually not serious. The local chemical inflammatory reaction makes many physicians and surgeons consider this an infectious process. There is no evidence that this type of peripheral venous thrombosis or simple thrombophlebitis are due to the invasion of bacteria into the veins. Thousands of cultures of clots have failed to show the presence of pathogenic microorganisms; consequently, we do not use antibiotics in the management of acute venous thrombosis.

Simple excision of the superficial areas of venous thrombosis by phlebectomy under local anesthesia has reduced the period of disability to only a few days. No antibiotics and no anticoagulants are indicated in this variety of venous thrombosis.

On the other hand, suppurative pelvic thrombophlebitis or pylephlebitis are due to pyogenic microorganisms and should, therefore, be treated intensively with potent broad spectrum antibiotics.

Ligation of the inferior vena cava should be reserved for such patients with ascending suppurative thrombophlebitis.

The common femoral veins, the external iliac veins, and the common iliac veins should not be ligated because the collateral venous circulation is very poor after the occlusion of these veins. Chronic edema of the extremity with permanent disability of a high degree usually results.

Prevention of Recurrent Attacks: Cardiac function must be kept efficient and all factors that produce stasis of blood in peripheral veins must be eliminated. Varicose veins should be removed by surgical operation and not obliterated by sclerosing solutions. Edema of the extremities must be controlled by properly fitted heavy elastic stockings.

The prolonged use of small doses of Dicumarol is indicated in some patients who have had recurrent attacks of deep venous thrombosis. It is difficult to standardize the dose and keep the prothrombin time at a therapeutic level without precipitating slight bleeding. If these drugs are used in ambulatory patients, the effect must be

carefully controlled by dependable laboratory studies upon the prothrombin activity of the blood at regular intervals.

Anti-Inflammatory Drugs: If pain and periphlebitis are prominent symptoms, or if the deep venous thrombosis shows signs of progressing proximally, the administration of Butazolidin should be started (100 mg. every six hours for four doses, then every eight hours for four doses, and finally every 12 hours for the final four doses). This is usually effective but its continued usage is dangerous. Trypsin and similar products reduce the swelling in acute periphlebitis but should not be used alone in the management of peripheral venous thrombosis.

Summary

The clinical syndrome that we refer to when we speak of the postphlebitic extremity varies widely with the intensity of the onset of intravascular thrombosis, the rapidity of its spread to collateral venous channels, and the extent of the involvement of either the superficial or the deep venous channels. The derangement in the mechanism of clotting of blood appears by all chemical and physiochemical methods to be the same in all types of peripheral venous thrombosis, but the tendency of the clots to extend into the smaller or larger veins varies greatly.

There is no clinical foundation for the separation of the process of intravenous thrombosis into a dangerous one and a nondangerous one, for all venous thrombosis is serious, dangerous, and disabling. Clots of blood may extend into large veins, fragment, and cause pulmonary embolism from any type of peripheral venous thrombosis.

In order to outline more accurately the management of the sequelae of peripheral venous thrombosis, we must understand the various manifestations of peripheral venous thrombosis. Since we have not yet determined positively the cause for venous thrombosis, we must have a good understanding of the various factors that contribute to the development of peripheral venous thrombosis.

It has been recognized for decades that some bacteria produce toxins that increase the coagulability of peripheral blood in normal veins. The bacteria that cause gas gangrene produce substances that alter the coagulation of blood, and therefore extensive venular thrombosis is often a sequela of gas bacillus infections. Certain staphylococci and meningococci cause the development of widespread localized venular thrombosis, as in the Waterhouse-Friderichsen syndrome.

Deep venous thrombosis at the iliofemoral region causes marked periphlebitis in that area and results in the clinical syndrome of phlegmasia alba dolens, while the rapidly spreading and fulminating type of venous thrombosis in young adults may result in such extensive venular thrombosis as to cause massive gangrene of the extremity. This condition has been named phlegmasia cerulea dolens (blue phlebitis) and has a grave prognosis.

From the therapeutic standpoint, every means of establishing a reasonable balance in the venous, arterial, and lymphatic circulations by medicinal, physical, and surgical means must be employed without delay.[6] If this balance can be established, the acute phase of the process can be brought under control, but we still may be confronted by the therapeutic problems associated with chronic venous and lymphatic stasis in the extremity with secondary induration of the subcutaneous tissue of the extremity, breakdown of the venous shunts of Sucquet, thrombosis of the venules, and ulceration with pigmentation of the skin. The problem still needs much concentrated study.

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Use of Transfusion and Fluids In Severe Hemorrhage

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This discussion will deal first with some of the better known and practical aspects of treating severe hemorrhage, and then with some of the more controversial areas of current study and therapy in which we have had particular interest. This approach is chosen because of a suspicion that our resident staff and students are occasionally not as aware of proved clinical guides to the management of severe hemorrhage as they are of the latest sortie into some single laboratory aspect of hemorrhage in the rat or dog.

Clinical Guides to Blood Replacement

In severe hemorrhage estimation of blood loss is actually a little easier than in slower loss. By evaluating information obtained from the patient's history in view of signs and symptoms of the degree of compensation (vasoconstriction, pulse and blood pressure changes), and the response to preliminary treatment one can obtain a fairly accurate estimate of the indicated blood replacement. For example, if an adult patient of average size began bleeding with a normal blood volume and the duration of bleeding has been brief — a few hours — and he has significant symptoms and signs (faintness, weakness, thirst, tachycardia) but no hypotension, he has lost between two to four units of blood. In general, the longer the period of bleeding that brought about such symptoms, the greater the blood loss has been.

If trauma was the cause of the hemorrhage, the same history and physical picture will represent a greater blood loss since there will usually be greater vasoconstriction — its presence can be crudely quantitated by the degree of mucosal and cutaneous pallor, sweating, and diminished renal flow. Given such evidence of considerable vasoconstriction in the same patient described above, the range of loss would be three to five units, rather than two to four. It is in this situation particularly where the blood pressure may be a very poor index of the amount of bleeding since it is maintained at the expense of flow. In other words, any given blood pressure fall is of graver import in traumatic than in simple hemorrhagic shock since it tends to represent a greater loss of fluid and greater vital organ ischemia.

Occasionally one can obtain helpful information by the "tilt" test. A patient losing two to four units of blood in a few hours may enter the hospital by litter and be put right to bed. He might note only minor weakness and/or thirst and exhibit a normal blood pressure. Upon tilting (sitting up) a significant fall in pressure may indicate that the blood loss is nearer four units than two.

An accurate estimate of blood loss must also depend on awareness of the effect of the state of hydration prior to hemorrhage and on the fluid intake subsequent to or during the hemorrhage.

Laboratory Guides

There are no currently valid laboratory guides which are of much value in the treatment of severe bleeding. Following an acute hemorrhage a relatively small amount of extracellular fluid and rapidly mobilized protein enter the intravascular compartment quickly. Then a steady but slow transfer of water and potassium from the intracellular compartment ensues. This takes many hours and is the major part of the total

fluid shift. Therefore, hemo-dilution from this source is not rapid enough to allow use of the hemoglobin and hematocrit as guides to blood replacement. Another factor making the peripheral hematocrit a poor guide is the fact that following severe hemorrhage sequestration and flow shifts can result in changes of total body hematocrit as much as 30% different from peripheral hematocrit.

Objections to the routine clinical use of blood volume determinations stem from many factors. In the first place, what is a normal blood volume? Under the best circumstances in healthy individuals determinations by use of Evans Blue Dye or radio iodinated serum albumin give values that are too high, and determinations made with chromium tagged red cells give values that are too low. Using both methods simultaneously narrows the error but leaves us with a normal range of 64 to 79 ml./k. for males of medium height and build. For a 75 k. male this would be a spread of over 1100 ml. of blood. Furthermore, the increased error due to greatly prolonged mixing time of the tagged cells or plasma and the unmeasurable changes in capillary hematocrit that occur during severe hemorrhage is another cause of waning enthusiasm for blood volume measurements in acute severe states. For these reasons, the clinical guides previously discussed will usually permit a more accurate estimate of acute blood loss than a blood volume determination.

Treatment of Severe Hemorrhage

Any patient suffering acute hemorrhage who has associated disease, a chance for early recurrent hemorrhage, or who may require emergency surgery should receive as rapid a restoration of his blood volume as possible. There are many good reasons for this philosophy, but the physiology of the metabolic responses to sudden decreases of blood volume must be appreciated if one is to apply this principle safely. Following an acute hemorrhage one of the early compensations is an elaboration of aldosterone and of adrenal medullary hormones. This results in diminished renal and urine flow and marked sodium and water retention. Water and potassium leave the cells and potassium excretion takes place. Although these are desirable compensatory mechanisms they cannot be quickly reversed, once established. When marked cellular dehydration and sodium retention have existed, the patient is almost without defenses should a second insult occur, be it another bleeding episode or an operative procedure. Ideally, therefore, blood should be replaced before these compensations have progressed or become maximal. If a patient has had a severe depletion of blood volume for more than 12 to 20 hours, however, only part of the estimated loss should be replaced quickly as the return of potassium and water to the cells takes many hours to complete.

One of the arguments formerly heard frequently was that the gastrointestinal bleeder was safer with a low blood pressure and that transfusions could result in blowing out the clot. The logical next step for such an argument is that dead people don't bleed at all. Another frequent comment is that congestive failure is a great hazard. This is simply not so if its risk is correctly assessed.

Review of the combined recent surgical service experience of Marquette's teaching hospitals over a three year period yields only two instances of pulmonary edema probably due to overtransfusion. Conversely, there are quite a few instances of gastrointestinal hemorrhage associated with angina pectoris until transfusion was accelerated.

Additional Emergency Measures

Plasma Expanders: It is well established now that plasma stored at the correct temperature for six months does not transmit hepatitis.[1] Either plasma or Dextran are valuable expedients in the early treatment of severe hemorrhage since they can usually be obtained promptly.

Rapid Cross-Match: Emergency typing and saline cross-matching of blood can be done in about five minutes and is relatively safe when compared to the risk of death from a hemorrhage causing a major fall of blood pressure.

O-Rh Negative Blood: In the hemorrhage that is so massive as to be immediately life-threatening, O-Rh negative blood without cross-match can be used. Col. Crosby has stated that no fatal transfusion reactions were observed during the entire Korean conflict when O-Rh negative blood was used.[2]

Probably the most important point about bleeding as fast as this is the fact that arterial hemorrhage of this magnitude is associated with an immediate major fall of blood pressure even before there is significant blood loss. The problem here is a hole in the dyke and, thus, no peripheral resistance. If one cannot control the source of hemorrhage quickly surgically, all these desperate intravenous measures will usually be a very expensive waste.

For rapid transfusions we prefer 13 or 15 gauge catheters; one can give a unit of blood in under 10 minutes with a sphygmomanometer bulb on the bottle air inlet needle, but much of of it will hemolyze if forced through an 18 needle, especially if it is older blood. This is the main reason for the large cannula. The blood can be pushed in by almost any conceivable

pressure arrangement but manual pumping combines ease and effectiveness.

Over a three year period at Milwaukee County General Hospital there were 104 patients who required transfusions of more than 10 units of blood. These patients received an average of 9000 ml. of blood, and the mortality rate was 64%. The point we wish to emphasize is that only four of these patients died as a result of transfusion. When one considers that the average amount of blood given was near 70% of total blood volume, and the average age was 66, this is good evidence that large amounts of blood can be given safely and, in many instances, rapidly.

Vasoconstrictors: One of the interesting paradoxes in this field is the fact that some authors are recommending adrenergic drugs (such as norepinephrine) while others are recommending adrenolytic drugs (such as Dibenamine, ganglioplegics). We have evaluated the effect of norepinephrine on mortality in experimental hemorrhagic shock.[3] Eighty-seven dogs were studied by administering norepinephrine either during or after hemorrhage and the mortality rate was double that of the control animals.

Early in the study we noted an interesting autopsy finding in the dogs treated with norepinephrine: the appearance of subendocardial hemorrhages particularly in the septal and posterior walls of the left ventricle. (This is so-called subendocardial infarction described by Master as due to myocardial ischemia usually in the absence of arterial obstruction.[4])

This lesion was noted grossly in only two of 20 control dogs, but was seen in 19 of 20 norepinephrine treated dogs.

Microscopic evidence of focal degeneration or necrosis of the myocardium was seen in only two of the 20 control dogs but in 13 of 20 norepinephrine treated dogs.

Although norepinephrine has been shown to increase both cardiac output and coronary flow during hemorrhagic hypotension, the myocardial damage noted in this study suggests that these increases are inadequate to meet the accompanying increase in myocardial oxygen requirement due to increased cardiac work.

We have concluded that norepinephrine is a dangerous drug in the presence of hypovolemia from any cause. In fact, we have used mild adrenolytic drugs in some cases of hemorrhage. Drs. Boba and Converse have several papers[5,6] reporting the use of ganglionic blocking agents in the treatment of hemorrhagic shock. This approach is certainly more in keeping with the bulk of experimental results. We must learn to think more in terms of blood flow; vasoconstrictors can lead to a false sense of security by elevating the blood pressure at the expense of flow in the organs whose functions are required for survival.

In summary, we trust we have said nothing that will conflict with the oft-quoted surgeon whose philosophy is as follows: "When my patient is losing blood, I give him blood. When he's losing plasma, I give him plasma. When he's losing Dextran, I give him Dextran — and when I find one that's losing Levophed, I'll give him Levophed."

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Static Electricity

A newly revised publication on controlling the fire hazards of static electricity has just been issued.

The 1961 edition of *Static Electricity* was adopted at the recent annual meeting of the National Fire Protection Association in Detroit. It contains a discussion of the theories of static electricity generation and dissipation. These theories are then applied to the handling and use of flammable liquids, gases, dusts, and fibers. Certain specialized industrial and commercial processes and equipment are mentioned along with a discussion on the various types of static detectors. The material in this guide has been developed by the NFPA Committee on Static Electricity, whose chairman is Edgar J. Meyers, Assistant Manager, Safety and Fire Protection, for E. I. duPont de Nemours & Co.

Copies of the publication (NFPA No. 77M, 60 pages, $1.00) are available from the National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass.

The Causes and Treatment of Acne Vulgaris

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Acne vulgaris is a disease which does not affect general health, and, ordinarily, is not physically incapacitating nor debilitating. Then, why all this concern? In answer to this question, one might state that acne vulgaris can be considered the greatest bane of the adolescent's existence, occurring usually at the age when for the first time the afflicted one wants to look his (or her) very best. No other disease is so prevalent in teen-agers and no other disease has caused so much feeling of inferiority. I personally have seen young girls who were so depressed by their "poor complexion" that psychiatric treatment was necessary in addition to dermatologic management.

There seems to be a change in attitude on the part of adolescents and their parents concerning this problem. Those afflicted seek help earlier. Most of these adolescents will come to their family physicians, who must not shrug off the problem of acne with such passing remarks, "You'll outgrow it," or "Don't worry, most of your friends have the same trouble." Active measures to combat acne are essential to keep the patient cosmetically presentable, and to prevent permanent scarring of the skin and of the psyche.

Etiologic and Pathogenic Factors in Acne

Hormones: There is little doubt in anyone's mind that certain hormones have a definite influence on the production of acne vulgaris. The onset of this condition at puberty, the flareups occurring at the time of menses, the absence of acne in eunuchs, all of these facts plus many others substantiate this hypothesis.

Experimentally, acne can be improved by the systemic administration of estrogens. Conversely androgens can aggravate it. Most dermatologists have seen acneform lesions appear in male and female patients who have received excessive amounts of the male sex hormone. At the moment, I am treating a man 55 years of age who developed rather severe pustular cystic acneform lesions on his face, chest, upper back, and buttocks following the administration of testosterone propionate for his waning virility. Female patients who receive combined estrogen-androgen therapy for the distressing symptoms of the menopause have been surprised to find that they are developing acne long after adolescence.

The importance of progesterone in acne is still a matter of controversy. There are many investigators who claim favorable effects. Other equally competent observers deny its efficacy. Theoretically, progesterone has been shown to have an androgenic effect, and it should aggravate acne. Therefore, it is difficult to understand how progesterone would be of any benefit in acne.

The development of acne in patients receiving corticotropic and corticosteroid hormones has been noted on a number of occasions. Fortunately, this complication occurs very infrequently and only after prolonged administration.

Heredity: It is well known, even among lay people, that there is a strong tendency to acne in some families. Parents who have had severe acne are quite anxious regarding their children's skin. I remember vividly a young mother with a face covered by pitted acne scars who almost developed an anxiety neurosis worrying about a few insignificant comedones on the nose of her six month old child.

Infection: Certain microorganisms have been trapped in comedones and pustules, but whether they are causative or secondary factors remain debatable. The favorable response of acne to

antibiotic therapy suggests that local infection with bacteria may play an important role.

Inasmuch as some patients with acne respond to very small doses of antibacterial agents that can not be considered bacteriostatic nor bacteriocidal, it was felt that these drugs may act entirely on microorganisms in the intestinal tract. However, no benefit in acne was obtained from using such antibiotics as neomycin and nystatin which are not absorbed from the gastrointestinal tract.

Foci of infection in sinuses, teeth, etc. have been reported to be responsible for the continuation of acne past the age of 20 and even 30. However, we have been unable to find such foci in most of these people, and, in an occasional patient, removal of an infected tooth or tonsil did not remedy the condition.

Foods: Despite popular opinion, acne is not a dietary disease. In my opinion, foods have been blamed indiscriminately as exacerbating and contributing factors. Too often I have seen young girls who have literally starved themselves to clear their faces, losing as much as 30 pounds in one case, only to have the acne continue unabated or even made worse. It is an injustice to deny milk, carbohydrates, fatty foods, pork, oranges, and many other foods at a period in an individual's life when he or she is in a stage of major development. The number of foods that aggravate acne is very small. I restrict only chocolates and cola drinks from the diets of adolescents with acne.

Drugs: It is a worth-while suggestion to ask about the ingestion of bromides and iodides in all patients with acne. One should be most suspicious of a drug etiology in a middle aged individual who suddenly develops a pustular and follicular eruption on the face, chest, and upper back. Patients receiving Lugol's solution and other iodides for thyroid disorders have suddenly become distressed by the occurrence of "pimples." Individuals who habitually take bromide preparations can develop the same trouble.

Cosmetics: Heavy greases, cream, and pancake type materials are contraindicated in adolescents with excessively oily faces and in those with acne. It is obvious that all such greases will plug hair follicles leading to comedones and subsequent pustular lesions. The treatment of acne has been prolonged in many girls who have used pancake type makeups unbeknownst to the physician.

Emotions: Acne is a disease produced by a disturbance in the hormones. Despite the belief of many patients and a few physicians, it is not a nervous disease. It is possible that emotional upsets are aggravating factors. Junior proms and final examinations will often precipitate a severe flareup. Only in the unusual case is it necessary to resort to sedatives and tranquilizers for the management of a patient with acne.

Treatment of Acne

It is important for physicians to make the treatment of acne as simple as possible. Adolescents are busy people and they have little time for complicated or prolonged procedures. They are also self-conscious and are not happy to use smelly or cosmetically inadequate preparations.

Acne is controllable but not curable. With the preparations I shall discuss, acne can be controlled during the "teen-age" years. In order to achieve the best results, therapy must be individualized. The concentration and frequency of application of local preparations must be adjusted frequently in some individuals, less often in others. The dose of internal medicaments frequently is increased or decreased. Treatment must be simple to the patient, but it is not simple to the physician.

Cleansing Agents: In recent years special cleansing agents have been developed that seem to have some merit. In acne patients with severe pustular lesions it has been our policy to use antibacterial soaps such as Phisohex which contains hexachloraphene.

In those patients with much sebum or numerous comedones, we like to use soaps containing abrasive substances. A good example of this is manufactured under the name of Brasivol. The face is washed once, twice, or three times daily with such preparations depending on tolerance of the individual's skin.

Resorcin and Sulfur Lotions: From time immemorial dermatologists have used sulfur and resorcin lotions as peeling and drying agents in the treatment of acne. Lately the pharmaceutical industry has made available to acne patients many cosmetically suitable lotions containing resorcin and sulfur. These preparations are skin colored, easy to apply and therapeutically acceptable. Rezamid Lotion (Dermik), Resulin Lotion (Almay) and Liquimat (Texas Pharm.) are a few examples. Usually application once daily is sufficient. If applied more frequently, the skin of the face becomes too dry, red, and scaly.

External Hormones: Stilbesterol has been added to sulfur and resorcin lotions by some manufacturers, but we have failed to ascertain any extra benefits from such combinations.

The addition of corticosteroids such as hydrocortisone to acnegenic lotions does not benefit the acne. However, it may reduce some of the inflammation or excessive dryness produced by sulfur and resorcin.

External Antibiotics: It would seem that pustular forms of acne would respond to external

applications of various antibiotics. However, we have tried many of the antibiotic ointments and lotions containing tetracyclin, neomycin, bacitracin, etc., but we have been unimpressed with their efficacy in pustular acne.

Internal Antibiotics: The systemic administration of antibiotics has proved to be the most useful addition to the therapy of acne in the past 10 years. While this applies especially to pustular acne, these agents are also effective in the papular form of the disease.

The tetracyclines seem to be the best of the antibiotics. Most dermatologists advocate 250 mg. four times daily for four days followed by a maintenance dose of 250 mg. or 500 mg. daily. It has been my experience that acne responds well to smaller amounts, and I usually prescribe as little as 125 mg. two times daily. Only in a few cases is it necessary to step up the tetracycline to 125 mg. three or four times daily. Patients are maintained on systemic antibiotics in this manner for periods varying from two to 12 months.

We are aware of the objections voiced against prolonged administration of these antibacterial agents. However, we have managed hundreds of acne patients according to the above schedule without any serious effects. The only complication from such therapy has been a mild diarrhea or pruritus ani which is always reversible when the antibiotic is discontinued.

Other antibiotics such as erythromycin and triacetyloleandomycin have been advocated, but they are not as successful in our hands. Oral penicillin has proved helpful where the tetracyclines have failed previously. The incidence of side effects with oral penicillin are practically nil.

Sulfonamides have been tried by us in the treatment of acne, but the results have been discouraging. We have treated large series of acne patients with the newer sulfonamides such as sulfasoxazole and sulfadimethoxine without much benefit.

Internal Hormones: Since the introduction of antibacterial agents, the need for systemic hormones has diminished. This is fortunate because hormones as we give them are of little practical benefit. In the past we disturbed the menstrual cycles of young girls by treating with estrogens such as premarin, but the benefits to the acne were questionable. Many of the girls had delayed menses. A few had excessive bleeding and clotting. All in all, the results were undesirable, and the acne vulgaris improved only a little or not at all. Strauss and his co-workers who have done much in the basic investigation of acne vulgaris claim that estrogens affected sebaceous glands and acne favorably, but only when excessive doses are given far beyond what is considered as safe.

Other Drugs: Orinase has been disappointing as a treatment for acne in the few times we have tried it. Diuretics such as chlorothiazide (Diuril) have been advocated to prevent premenstrual flareups of acne. Our patients obtained no benefits when placed on this drug.

Ultraviolet Irradiation: Practically all patients with acne vulgaris improve in the summer, and we feel that the sun's rays are responsible for this improvement. Therefore, in the winter, we suggest that many of our patients purchase an inexpensive ultraviolet bulb (G.E. or Western Electric Sun Bulb). Daily exposures of 15 to 30 minutes has a noticeable beneficial effect in most individuals with acne.

X-Ray Irradiation: At one time practically all of our acne patients received superficial x-ray therapy. At present, it is only the unusual resistant pustular and scarring form of acne that is treated with roentgen rays. We still believe that x-ray therapy is an excellent and safe form of therapy in selected cases. X-ray therapy has fallen into disrepute because of widespread alarm concerning atomic fallouts and others forms of irradiation. The success of local preparations and systemic antibiotics reduces the need for x-ray irradiation. However, we feel that x-ray should be reserved for those patients in whom the acne tends to produce severe and disfiguring scarring.

Dermabrasion: When first introduced, dermabrasion was claimed to be the solution to post-acne scarring. However, the extreme enthusiasm for this procedure has abated. There are limitations to the results expected from this method. Originally patients with pitted scars expected a perfect skin. All agree that improvement occurs, but the results are far from perfect. Dermabrasion is recommended only for the occasional patient. Time does much to ameliorate the scarring of acne.

Comments

In this discussion, I have not mentioned the numerous studies that are in progress in search of a solution to this serious problem of adolescents. Much is being done, and soon one of our bright young investigators will determine the cause of and a cure for acne vulgaris. I can dream that acne will be controlled by a few pills, just as the unpleasant symptoms of the menopause can be relieved by estrogenic hormones. In the meantime, physicians should treat these unfortunate young people with interest and sympathy in addition to the antibiotics and the other methods available to us. Both the physician and the patients will be gratified with the results.

The After Effects of Head Injuries

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All of us who deal with trauma, either in its acute phases or subsequently in its phases of chronicity, encounter some of the real, relatively clear-cut, and often rather serious after effects of head injuries. In general, with those patients having severe residuals, our problems in the way of proper evaluation and of proper management are not particularly puzzling, but the patient with the comparatively trivial head injury can try the intelligence and patience of any of us. Frankly, I feel that we too frequently tend to minimize his complaints and thereby assume a rather cold-hearted attitude toward his real problems.

Unfortunately, the circumstance of current medical practice with its legal and compensatory ramifications has made it inevitable that the sincerely injured and sincerely suffering patient be commonly regarded and treated in the same manner as the one who is "trying to make the most of nothing" and who probably has been advised by unscrupulous legal counsel. As we well know, there is also the patient looking for monetary compensation without legal counsel who further contributes to this attitude.

I need not dwell long on the legal aspects of injuries in general, nor upon the legal aspects of head injuries in particular. Still, it is inevitable that all of us who deal with trauma are obligated to orient ourselves in the light of legal medicine rather than in the light that we would prefer, of solely a medical and humanitarian one. Each year in our practice of neurological surgery and as consultants in chronic head injury cases, we have more than our share of entanglements with unscrupulous legal advisors.

This by no means implicates the legal profession in general, but it does implicate that small percentage of parasites, if you will, who thrive on making the most of such trivial problems to their own obvious monetary benefits. Too regularly the legal aspects of these cases revolve about winning regardless of the manner, rather than about seeing that justice is achieved. Furthermore, in litigations of this nature the matter is decided not necessarily on what is actually or morally right, but on what is legally right.

Hence, in dealing with the legal aspects of injuries we have no alternative but to be entirely objective in our evaluation of the patient's history, and certainly to be objective in our examination of him. Initially, there should be no choice but to give the patient the full benefit of the doubt and to allow ourselves adequate time in our evaluation and observation to determine, as best we can, the true picture. Complete history, past and present, clarification of current symptoms, the patient's response to treatment, and repeated thorough examinations, are mere elementary necessities, but our final decision can be based only upon objective facts. What other means do we have, with crystal balls and other wonderful machines not yet available to help us?

We are further confronted with regularity by the patient who suffered a head injury, severe or trivial, and at the present may have objective findings or not, whose chief concern is monetary compensation, and who is without benefits of legal counsel. This group is difficult to differentiate from the group with legal counsel and perhaps should not be mentioned separately. Many people who have suffered an injury have as their chief concern the ultimate monetary benefit. Many of them, never having been endowed or blessed with material possessions, feel that this is their one opportunity to "make it up." This may be human nature; I cannot say. Nonetheless, the compensation aspects of injuries, with legal aura or not, do make the doctor's evaluation of the problem, within the limits of his ability to

evaluate such problems, a difficult one. Again we must understand that the truly injured patient is often the one who suffers for these extenuating and unpleasant sidelights created by others.

Another problem that might become rather pressing, especially if combined with proper legal support, is that of the group of patients who suffer post-injury neuroses. From some court decisions it would appear that a post-injury neurosis can be regarded as serious a residual as that of true organic disability. Actually, who is qualified to decide whether such a post-injury neurosis is as severe as true physical disability? I shudder to think of the consequences, if this complex becomes a regular instrument of the small percentage of unscrupulous legal advisors.

In casting aside for the present the troublesome and misleading aspects in our proper evaluation of the head injured patient, we must consider the seemingly true aftermaths of head injuries as best we can assess them and as best we know them to be at present. The patient who suffered a severe head injury with truly objective deficits afterwards does not constitute too trying a problem, and it is the patient who suffered a genuine but trivial injury who will be our immediate concern.

There are people who have had extremely severe head injuries with extremely severe deficits in the acute phases, who, given enough time, have made complete and asymptomatic recoveries, whether the injury itself was compensable. Also, there is the category of patients with a history of trivial head injury, compensable or not, who have made similar complete and asymptomatic recoveries. With the years and with our increasing understanding of the problem, some of these people are the ones to whom we can resort to establish a possible base line for certain seemingly true post-head injury symptoms and residuals.

Those proved, reliable, and observing patients who have suffered head injuries of relatively minor moment with possibly a period of unconsciousness who on recovery with no evidence of objective findings generally present certain symptoms that in their uniformity and consistency have constituted and led to the known entity and diagnosis of "post-concussion syndrome." The more severely injured group even with objective residuals have similar symptoms. Among these symptoms are headaches, postural lightheadedness, fatigability, irritability, lack of energy and drive, intolerance to bright lights and loud noises (probably a further manifestation of their irritability), anorexia, insomnia, or undue sleepiness. In addition there is apt to be an intolerance to alcoholic intake. Whereas prior to a head injury a patient could probably have had several alcoholic drinks in an evening's time with no seeming problem, now even a small amount of alcohol causes unpleasant symptoms.

As a general rule in considering this train of post-injury symptoms, not all of which need be present in every person and any of which, of course, can be of varying severity, we use a rather broad base line of comparison. The true post-concussion syndrome patient, despite his current complaints of symptoms and severity of symptoms, will with time experience and admit improvement, whereas the one with a neurotic fixation upon his symptoms and injury, or the one with a legal fixation, if one might call it that, in the same situation continues unchanged or gets worse with time, with again no objective symptoms developing. The typical patient with a true post-concussion syndrome, despite his multiple complaints and no doubt real complaints at the time he is evaluated several months after injury, will readily admit that in contrast to, for example, two to three or six months ago he feels better, though not necessarily free of symptoms.

Another general trait referrable to this chain of subjective complaints is the duration of the symptoms in direct proportion to the patient's age. Needless to say, the severity of injury and severity of actual symptoms affects the period of duration also.

The young patient who suffered a head injury will recover symptomatically in a proportionately shorter time then the elderly patient who suffered an apparently identical trauma. However, even in the very young, symptoms might persist for many months and in the elderly they might persist for many years. The elderly patient with his expected slower improvement of symptoms may actually not be able to realize his own improvement because of the very slowness of it, but the doctor, by documenting carefully the description of each symptom at each visit and comparing his notes, can often readily conclude correctly the actual though agonizingly slow progress.

At this time the various symptoms themselves need not be considered individually, as they are likely to vary widely in their character, severity, periodicity, and duration from patient to patient. The mere presence of these symptoms regarded in the proper light of the nature and circumstances of the injury and the course over several weeks or several months time enables us with fair certainty to decide whether the diagnosis is a true post-concussion picture or not.

The time that the patient is able to resume his normal activities and work should be governed by his ability to tolerate such activity and

work, and releasing the patient from medical care and to his job in industry constitutes a real problem for the physician. It is here especially that the sincere patient is likely to suffer for the aberrations of the insincere and, frankly, it is impossible to say how one can, at times "sort the chaff from the wheat." A real variable is the hardiness of the individual and his ability to tolerate pain or other unpleasant symptoms, and as yet, again, we do not have the aforementioned "crystal balls." Some people simply are more able to tolerate discomfort than others and the others cannot be mistreated for their weakness, if one might call it that, no more than they should be condemned on the basis of their other endowed individual traits.

I know personally that prior to my having had a severe toothache, I had always more or less considered a person complaining with a toothache as rather effeminate and spineless. Personal experience does open one's eyes and help one's understanding of the problems of others.

Certain activities required in one's daily life and occupation are apt to aggravate some of these subjective symptoms following head injury and obviously must be avoided if ultimate recovery is to be expected. I am reminded of the comparison of the man beating his head against the wall, as it felt so very good when he stopped.

We can only do our thorough best in dealing with such patients; allow them enough time to recover sufficiently to resume normal or near normal activity, treat their individual complaints within therapeutic reason, examine them repeatedly and hope and pray that one of the backsliders is not taking advantage of our better selves.

Mention has been made several times of the patient under consideration presenting no objective findings. We must necessarily assume that no objective findings existed prior to the injury of concern, and here industry with its generally required pre-employment physical examinations has the advantage over other spheres of medical practice. Some industries even require an electroencephalogram prior to employment; this most wonderful test will be considered a bit later.

Should objective deficits result from craniocerebral trauma, they must be considered in the light of the over-all problem and to elaborate upon each such possible deficit now would be most unfeasible. If deficits do result, our only resort is to try to adjust and to rehabilitate the patient to his particular environ so that he can optimally do his allotted assignment within his abilities to do so.

Consultants are often criticized for advising certain limitations for the patient based upon a sincere estimate of the over-all situation. Objections usually do not evolve from the recommendations of restrictions placed upon the cardiac patient, but they do seem to evolve too often from recommendations of restrictions for the injured patient. I speak, of course, from the exalted aspect of the consultant and I know that the doctor at the "grass roots level" will often disagree — no one can say who is correct, but I do hope everyone will realize that such advice has been duly weighed and considered before it was given.

Reference was made earlier to the electroencephalogram. Its value in assessing post-head injury problems is far from proved, and, frankly, I believe most often misleading or noncontributory. We must remember that we as doctors must treat the patient and not the test; that the electroencephalogram is only a test; that possibly with more time and with our added experience in its interpretation it might some day begin to approach the reliability of the electrocardiogram; that the medical profession, the legal profession, and the public in general has been most effectively "brain washed" as to its infallibility; and that at times it is grossly misleading even in the presence of true and severe cerebral or intracranial pathology. Its most vociferous proponents will admit that it does not always (and, I must add, "often it does not") demonstrate the expected classical meanderings of ink on paper even in severe and classical epilepsy. It further often shows these abnormal meanderings for people who have no neurological difficulties and who never had convulsive bouts in the past or during long years of observation after such startling graphic tracings were reported.

Please do not place too much confidence in this machine as its alleged miraculous and clairvoyant powers simply do not exist. I do not deny its worth in certain instances, but I do feel everyone has come to expect too much of it.

One irritating and not too infrequent question we face with head injuries is the problem of aggravation of a pre-existing condition. Again, all we can do is to note the facts as observed and evaluated and admit that such aggravation is possible. What the compensating responsibility will be is difficult for us to decide, and for that matter for anyone to decide with certainty and true justice. We have had many patients who, prior to a head injury, harbored an asymptomatic brain tumor, that conceivably might have begun to produce symptoms in the near future, but which nevertheless was asymptomatic (with the above provisions) until a blow occurred to the patient's head. The blow did not cause the tumor, but the symptoms of the tumor were manifest immediately or shortly after the blow. I well remember one man who had a trivial head in-

jury and within a few days time presented all the characteristics of a subdural hematoma, but ancillary tests and procedures as well as later definitive surgery revealed a malignant glioma of the brain. I do not know where to place the compensatory liability.

The patient who develops convulsions after a head injury poses another problem. We must again assume he is sincere in his story and not denying previous such bouts.

A certain percentage of the populace will develop seizures without history of trauma to the head, and should such seizures ensue following trauma to the head, who can say if the trauma was responsible? Obviously this development makes the personal injury lawyer beside himself in joy.

Severe cranial and cerebral trauma with a long period of unconsciousness, with or without objective neurologic deficit afterward, and presumably on the basis of severe cerebral contusion or laceration, will, in about 30% of such cases, be followed at some future date by convulsive bouts. I doubt seriously that seizures will result from a trivial blow to the head with no period of unconsciousness or only a short one. Regardless of cause, once a patient does have seizures, he must be treated as a convulsive with appropriate medications for many years; he must abstain from alcohol completely; he should not drive a vehicle for at least one year after his last seizure and then only if he follows his anticonvulsant regime faithfully; and he should not work in an environ where he might, in losing consciousness, injure himself or others about him.

These are only a few of the problems we face in our experiences with patients suffering head injuries. I do not know if this consideration will make the management of such patients any easier, but I do hope that it will benefit the actually injured and suffering sincere patient in the way of our understanding him and his problems, rather than as is too often true, neglecting him because of the stigma created by other selfish people.

On Hiring Mental Patients

How much employer resistance is encountered by patients discharged from state mental institutions? To find out, Dr. Harvey E. Wolfe of Longview State Hospital in Cincinnati questioned officials of 251 manufacturing concerns hiring from 100 to 14,000 employees, and 934 manufacturing firms hiring less than 100.

Employers in both groups, Dr. Wolfe reported, "significantly favorable attitudes" toward hiring former mental patients. Forty-two percent of the larger employers said they'd be "interested" or "very interested." Sixty percent of the smaller employers were in the "interested" categories.

The period of this Wolfe questionnaire investigation is not known. Conceivably it may have antedated the Supreme Court Ruling in the State of Michigan on the Carter versus General Motors Corporation case. In that decision the Michigan Supreme Court held that under some circumstances the recurrence of an abnormal mental state might be made the basis for successful claims for workmen's compensation in a workman who had resumed employment.

The breakdown reported by Dr. Wolfe:

	Large Firms	Small Firms
Will not consider employing	8%	7%
Hesitant about employing	16%	16%
Slightly interested	32%	22%
Interested	37%	34%
Very interested	5%	4%

THE PREVENTION OF BLINDNESS

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Blindness is an easy affliction to imagine. As children we all played at being blind for a short time and got a glimmering of what it means. But it was never a popular game for it was too shocking in fact.

This is elementary to the real thing, for learning how to cope with blindness, day in and day out, is one of the most difficult arts a handicapped human being must master. That is why there are so many organizations set up to aid the blind, and most of them do a superb task. The cost in money and time is almost beyond calculation, and the impact of even one blinded person on himself, on our society, and on our economy is almost beyond measure.

It is estimated by the National Society for the Prevention of Blindness that in mid 1960 there were 356,000 legally blinded individuals. As our population increases and ages, the number will continue to increase, though not as rapidly as hitherto, we hope and expect. Approximately 50% of this blindness is preventable or remediable, and efforts are constantly being made to increase this percentage. It is a continuous war. We strive for the irreducible minimum.

Over half of the legally blind are 65 years old and older and blind women exceed blind men by about 40%. The latest figures compiled by the Health Information Foundation (September, 1960) show that there are 37 per 100,000 blind under the age of 20, 91 per 100,000 at ages 20 to 39, 211 per 100,000 at ages 40 to 64, and 1,189 per 100,000 at ages 65 and over.

The causes of blindness are many, and as medical knowledge increases the picture and figures about them shift. Blinding infectious diseases, such as gonococcus ophthalmia, syphilis, trachoma, and a host of other conditions so well described in our old textbooks, are no longer the problem they once were. They are still with us, however, to a certain extent. In 1940, infectious diseases caused 21.2%; in 1957, only 9.7%.

I readily recall, from my training in Boston, the hospital ward devoted to the care and treatment of the newborns with ophthalmic neonatorum, and also the ward under my care at the Cincinnati General Hospital set aside for the same purpose. The recollection of the experience is of a horrendous nightmare. Thanks to the sulfa drugs and penicillin, these wards are gone.

In 1940, blindness caused by accidental injuries amounted to 8.8% of the total. These injuries occurred in the home and in industry; a part were caused by auto accidents, and a smaller part by other accidents. Blindness due to industrial accidents received the greatest attention at that time, and safety measures (goggles, etc.) had a wonderful impact. Accidents in the home are still with us and deserve the spotlight as we shall see. At any rate, accidental injuries as a cause of blindness has fortunately decreased to 4.9%.

The incidence of poisonings, including excessive oxygen to the newborn which causes retrolental fibroplasia, as a cause of blindness has increased from 0.5% to 2.7% as the result of retrolental fibroplasia, which can now be prevented.

The incidence of blindness from general diseases, such as diabetes, vascular, and others, have increased from 5.1% in 1940 to 15.9% in 1957. This group causes greatest concern, not only to the ophthalmologists, but particularly to the general physician, since this increase is directly due to the fact that our older people are being kept alive longer.

Hereditary blindness seems to be on the increase (from 9.5% in 1940 to 13.5% in 1957). Why is this?

Glaucoma and cataract of as yet unknown etiology as causes of blindness comprise between 34% in 1940 to 38% in 1957. This is most discouraging. Our Societies for the Prevention of Blindness, both local and national, are alert to this problem, and are directing their talents to reducing these percentages, by constant effort.

In summary of the problem of blindness, we see that infectious diseases are no longer much of a factor, metabolic diseases have inherited the first place, and cataract, uveitis, and particularly glaucoma, are still with us unchanged in their forces. Accidental injuries and poisonings are still factors to be reckoned with and require constant vigilance. Theoretically the incidence should be zero.

The blindness due to industrial injuries has been marvelously decreased as the result of awareness and action taken by industry, although there are still gaps here and there. For example, are the workers in our armed forces who deal with gases, chemicals, and machines getting the

same protection as their civilian counterparts? They were not, to my knowledge, during the war, but perhaps this is not true today.

Injuries to the eyes in the home account for most of the figures in this field, today. Why is this? Ignorance and inertia are answers. The child must be protected against sharp objects, pencils, knives, scissors, etc., but particularly against certain toys. It is good to note that there is a fresh campaign developing against harmful toys. Fireworks are almost everywhere abolished, although bootlegging is still with us, and an occasional eye is blinded as the result of bootlegged fireworks. Protective goggles should be worn by the hobby-shop worker, the auto mechanic, and the farmer.

Cataract, while it cannot be prevented or retarded, is amenable to surgery, and the greater the experience and skill of the surgeon, the more of these cataract patients that are restored to useful vision. The incidence of successful surgery, thanks to modern and better techniques, drugs, and medical care, has increased to such a point that 95 to 97% of cataract patients are successfully operated upon. One of the reasons for this remarkable figure is the splendid training the residents in ophthalmology are getting. It is no longer pertinent to say, with a German ophthalmologist of 50 years ago, that one has to spoil a hat full of eyes in order to be a good cataract surgeon.

Why, then, are not more cataract patients restored to useful visual life? Again our enemies, inertia and ignorance, are to blame for the most part. A number of these patients are terribly afraid, or use their blindness as a shield against the cruel struggle of life; they want to be sheltered and loved, and in some cases wish to continue the small security of a blind pension.

The glaucoma problem is the chief offender in this group. As you know, there are two types of primary glaucoma, the blocked angle form and the so called glaucoma simplex. These are two different maladies. The block angle form is cured by iridectomy, and since it usually has pain and congestion with the bouts of blurred vision, the patient assumes his self-responsibility and seeks medical care.

Glaucoma simplex is our greatest villain. Two percent of all people over 40 years of age have glaucoma simplex. This figure applies to the members of this audience as well as to everyone else. It has no early symptoms, whatsoever. It is difficult to diagnose early, even by the expert. Unless recognized and appropriately treated, the earlier the better, it leads invariably to hopeless blindness. Prevention of blindness due to glaucoma simplex is our chief concern at this moment. With the leadership of the various organizations and societies concerned with the prevention of blindness, a massive attack on the problem is underway. One of the weapons of considerable potency at hand is the placing of the tonometer (for measuring ocular tension) in the hands of all general practitioners and teaching them to apply the instrument to the eyes of all individuals over 40 years of age whom they see in their daily work. This will uncover the suspected case of glaucoma, and such a patient should then be referred to an ophthalmologist.

The medical treatment of glaucoma simplex has enormously improved in the last decade. We have available many more effective drugs and, thanks to experimental research, new ones are coming forth in good numbers. The surgical treatment of the condition is still not completely satisfactory. Surgery is hazardous and not always successful. Indeed, it is sad to note that the vision of many eyes has been worsened and sometimes lost as the result of surgery. Ophthalmic surgeons are keenly aware of this fact and are constantly striving to improve their skills and techniques, particularly in the proper training and supervision of their residents, for in this lies our future increment of success.

The problem of the metabolic diseases, especially diabetes, is of major concern in the prevention of blindness. I see more and more patients, usually elderly, going blind because of diabetic retinopathy for which at the moment nothing whatsoever can be done. We must depend on our colleagues in internal medicine to do the major job in the prevention of diabetic retinopathy, for once it begins the course is relentless.

The same argument applies to blindness caused by vascular disease. The problem of atherosclerosis and vascular hypertension is the object of a massive world-wide attack. There is good reason to have much optimism that the near future will reveal many answers to this facet of the cause of blindness.

We see, therefore, in this short discourse, that the prevention of blindness consists of a great many things. Protective devices, abolition of fireworks, the control of accidents in the shop, the farm and in the home; the training of industrial physicians and nurses in the treatment of ocular injuries and burns, the training of the general practitioner in doing better ophthalmology and in the measuring of ocular tension; all of these are important.

But there is more to this problem. Our residents in ophthalmology need to be better trained, particularly in surgical skills; our experimental research programs need massive expansion; our libraries and clinical facilities and lay organizations need expansion, support, and encouragement.

Plans for the Care of the Aged

-the sensible way

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My assignment can be reduced to two primary concerns. The first of these is to present an outline of the provisions of the Social Security amendments of 1960 — which we call the Kerr-Mills Bill and which is Public Law 86-778 — and to comment on its implementation by state legislatures. After a brief explanation of these amendments, I shall explain the provisions of the King Bill and how they are a general threat to American medicine.

Since the 87th Congress convened on January 13, 1961, roughly 7,000 bills have been introduced. Of this number, approximately 350, so far, are of interest to medicine. Our Council on Legislative Activities will consider 100 or more of these bills in the coming weekend, when I shall attend a meeting in Washington, D. C. Of highest priority in this Congress is the opposition of American medicine to H.R. 4222, 87th Congress, the King-Anderson Bill. When we indicate our willingness to concentrate about 90% of our attention on this one bill, you can see how important we consider this particular proposal to be.

The Kerr-Mills legislation, passed during the 86th Congress, is an omnibus bill which consists of seven distinct titles.

Medicine today is primarily interested in Title VI of the law, which does two things — it amends the Old Age Assistance Program to provide an increase in Federal matching funds for those states which have vendor medical care programs and establishes a new program of medical assistance for members of our aged population not receiving Old Age Assistance benefits. For the purpose of distinguishing between the two programs, I will refer to the Old Age Assistance Program as the OAA Program and the new program as the MAA Program.

I will not discuss the other six Titles of the law despite the fact that some of them, in part, do have medical implications.

Also, before going into the details of Title VI, it might be desirable to review very briefly the development of the Old Age Assistance Program.

It began with the passage of the original Social Security Act in 1935 which included Title I — Old Age Assistance; Title IV — Aid to Dependent Children; and Title X — Aid to the Blind.

In 1950, Title XIV was added to the Law, providing aid to the permanently and totally disabled. Until 1950, money states spent on individuals under these four programs had to go directly to the individuals to be eligible for Federal matching. None of it could be earmarked for any particular need — clothing, food, shelter, or medicine.

In 1950, the definition for Old Age Assistance was changed to "money payments to, or medical care in behalf of, or any type of remedial care recognized under State Law in behalf of needy individuals who are sixty-five years of age or older. . . ." While the formula for computing OAA payments has been modified from time to time, it was this amendment in 1950 that first authorized the states to establish vendor medical payment plans.

Title VI of the Social Security Amendments of 1960 — the Kerr-Mills Law — rewrites the requirements of state plans by establishing three categories of requirements. The first category, which applies to both OAA and MAA plans includes, among others, the requirements that:

1. The program must be in effect in all political subdivisions of the state.

2. There will be financial participation by the state.

3. It will be administered by a single state agency.

4. A number of detailed specifics relating to Federal-state administrative procedures and necessary reports.

The second category of requirements which apply only to the Old Age Assistance Programs provide that:

1. The state agency, in determining eligibility, shall take into consideration any other income or resources of the individual.

2. Reasonable standards shall be established for determining eligibility for and the extent of such assistance.

3. A description of services shall be provided, including the utilization of other agencies providing similar services.

With the exception of the provision requiring reasonable standards for determining eligibility, these requirements are substantially the same as those contained in the previous Old Age Assistance Law.

The major change made by the Kerr-Mills Law, as it applies to the OAA Program, is the provision that authorizes an increase in Federal contribution to states that have established vendor medical care programs. As of November 1, there were eight jurisdictions not eligible for increased contributions because they did not have vendor medical payment plans. They are: Alaska, Arizona, the District of Columbia, Georgia, Mississippi, Montana, South Dakota, and Texas.

The amount of increased contribution a state can obtain is based on a rather complicated formula involving the states' relative per capita income and the average amount spent per OAA recipient. Suffice it to say that as of October 1, states with vendor medical care programs will receive more Federal reimbursement amounting to at least 15% of the vendor payments, up to an average expenditure of $12.00 per recipient per month. Some states could receive new Federal grants amounting to as much as 80% of the amount spent in vendor medical payments.

The third category of requirements provided by the new law is concerned only with the new program of Medical Assistance for the Aged for those not under OAA.

With respect to the scope of benefits under the MAA program, the only limit is a minimum level — the state plan must provide for the inclusion of some institutional and some noninstitutional care and services. There is no limit, however, on how much or how many services may be included. The law provides a list, which I am sure you have seen: "inpatient hospital or clinic services; home health care services; private duty nursing services; physical therapy and related services; dental services, laboratory and x-ray services; prescribed drugs, dentures, eye glasses, and prosthetic devices; diagnostic, screening and preventive services;" and (just in case anything was missed) the law also authorizes "any other medical care or remedial care recognized under state law."

While there are two programs, the law specifically provides that it is not to be construed to permit a state to have more than one plan for the aged. In other words, both programs have to be administered by the same agency. This does not mean, however, that if the program were administered by the state department of public welfare that it could not contract with the department of health, a medical society, Blue Shield, or some other agency to carry out the medical care programs.

The matching formula under the MAA Program is similar to the OAA Program in that the percentage of Federal contribution is based on the states' relative per capita income. However, it differs materially in that the only limitation on the Federal contribution is the amount that the state is willing to appropriate for the MAA Program. This program was instituted to provide a sound and effective voluntary program of health care for the needy and near needy aged and to obviate the need for a compulsory mechanism under Title II of the Social Security Act. This intended purpose did not and will not, however, prevent the proponents of such a program from introducing it as a supplement to this law.

It has been charged that the Kerr-Mills legislation is not effective because it is not being implemented. Actually, nothing could be further from the truth. I doubt if there is any other program calling for Federal-state grants-in-aid which has been implemented as speedily as the Kerr-Mills bill. This law was signed by the President in September to take effect in October, 1960. At the time the bill was signed, virtually every state legislature had already adjourned. One state called a special session to pass enabling legislation. In the few months since this program has been law, there are programs now in effect in six states and Puerto Rico and the Virgin Islands. In eight additional states, legislation has passed the legislative house and will soon be in effect. In 15 additional states, legislation has already been introduced and will become law as soon as is passes in the state. Legislation is under consideration or in the process of being drafted in 15 additional states. In only six states, plus Guam, no action is being contemplated in the legislatures at the present time. We are urging physicians and others to work with the states to implement this program. This program can be particularly successful since it is operated by the state and pays for the medical expenses of the needy and the near needy.

The provisions of the King-Anderson Bill, on the other hand, provide for financing of certain

health care through the Social Security mechanism for individuals 65 years of age or over if they are entitled to Social Security or Railroad Retirement Benefits. Specifically, the bill would provide up to 90 days of inpatient hospitalization in semiprivate accommodations per spell of illness, subject to a $10-a-day deductible for the first 9 days, with a minimum deductible of $20. To be eligible for hospitalization for the same, or for a new condition, a period of 90 days would have to elapse since the individual was last an inpatient in a hospital or nursing home.

Hospitalization would include those services normally provided in a hospital, but could not include medical or surgical services provided by a physician, resident or intern, except in the field of pathology, radiology, physiatry or anesthesiology. However, both medical and surgical treatment could be given by residents and interns in a teaching hospital. Private duty nursing would not be authorized in any hospital. This part of the program would become effective on October 1, 1962.

It would also authorize payment for up to 180 days of convalescent care in a nursing home for conditions for which the patient was treated in the hospital.

The individual would be able to receive the authorized services from any provider who meets standards set by regulations promulgated by the Secretary of HEW, if the provider has entered into an agreement not to charge the patient for the services, except for the deductibles provided in the bill and for more expensive services the patient may request. Payment to the providers would be based on "reasonable costs" for the services. The Secretary of HEW would prescribe regulations for determining reasonable costs.

To meet the cost of the program, the wage base on which Social Security taxes are paid would be increased from $4,800 to $5,000 beginning next year. To compensate for this, the maximum Social Security cash benefits would be increased by $3 a month to $130. Further, the Social Security tax would be increased in 1963 by one fourth of 1% for employees and employers and three eighths of 1% for the self-employed. Thus, if the bill is enacted, in 1969, when the Social Security Program matures, the employee and employer will each be paying $237.50 a year. This is $7.50 more than the average worker with two children and a $5,000 income pays in income taxes. The self-employed individual would be paying $356.25 a year.

Nor are these figures complete. Mr. Kennedy has submitted another bill liberalizing Social Security benefits for certain of the aged and which calls for an additional $12 tax for the employee and employer and $18 for the self-employed beginning in 1963, if not sooner. Passage of this bill is virtually assured.

The most common argument in favor of this legislation is that the majority of the aged are in need of medical care and are financially unable to meet the cost. This attitude is indicated by the wide publication of a statement that in 1957 ". . . three-fifths of the people 65 and over had less than $1,000 in money income . . ." which was contained in a report to the Committee on Ways and Means by the Secretary of Health, Education and Welfare (Hospitalization Insurance for OASDI Beneficiaries, April 3, 1959).

In effect, this statement means that 9 million of our 15 million people over 65 have incomes of less than $1,000. Yet, there are only 2.5 million people on the public assistance rolls. It should be obvious, therefore, that in arriving at this conclusion nonworking wives and other dependents are included in the computation. Suppose a statistical sample were taken of 100 executives who earn $30,000 a year and their wives. Further, suppose that the wives have no private income of their own. The results of such a sample would be that one half of those sampled had incomes of $1,000 a year or less.

The same report points out that the median total income of retired Social Security beneficiaries is $183 per month. It also points out that the average retired couple had a median net worth of $9,620 and that 75% of OASDI beneficiary couples own their own homes with a median equity of $8,360. Eighty-seven percent of these homes are mortgage free.

In the future, the economic status of the aged is expected to be even better — partially because of increases in Social Security cash benefits and partially because of situations described below.

Much also has been made of the fact that the average Social Security payment is approximately $73 per month. This figure does not include such other sources of income as:

1. From corporate pension plans, 1.5 million people now receive cash benefits. In the future, 19 million people now covered by such plans will also receive these benefits. The number covered by corporate pension plans is growing at a rate of about 1 million per year, according to a statement by David A. Lindsay, Assistant to the Secretary of the Treasury, before the Senate Finance Committee on H.R. 10 in June, 1959.

2. One million retired persons currently receive annuities that were privately purchased. Here again, the number is expected to be larger in the future.

3. One million persons over 65 receive veterans' pensions and are also eligible to receive

Social Security benefits. This number will increase rapidly in future years because of the aging of the veteran population.

4. Four million individuals over 65 are employed, some of whom are receiving Social Security benefits and income relatively the same as the average of other workers.

On its face, the assumption that all 15 million of our aged are ill and in need of medical care is patently false.

I would like to comment now on certain other objections to the King bill:

1. The so-called Social Security approach for medical care for the aged will not provide, in most instances, care where the care is needed; namely, among the indigent and the near-indigent. Of the 2½ million persons receiving old age assistance, only 600,000 would receive medical benefits under the Social Security approach and in some cases not as extensive medical care benefits as they currently receive.

2. The Social Security approach will become more expensive as the number of the aged increases, even though the proportion of needy aged will be decreasing. It is estimated that there will be 20 million people over 65 in 1970, 90% of whom will be covered by Social Security. The percentage of individuals over 65 receiving old age assistance, which was 22% in 1950, dropped to 15% in 1959. By 1970, it is expected that this percentage will be 11%.

3. The Social Security approach is unnecessary. In January, 1960, 49% of those over 65, or approximately 7.7 million persons, had some form of health insurance. The insurance industry estimates that by 1970, 90% of the aged wanting coverage will have it. Until that time, those who are in need and who cannot afford private health insurance can receive care under the Public Assistance Programs such as the Old Age Assistance and Medical Assistance for the Aged programs contained in the Kerr-Mills law, through veterans' medical care programs, or medical care programs for retired military personnel and their dependents.

4. The Social Security approach is unfair in that it places the burden of meeting the cost of the program only on low income workers and then on gross income up to $5,000. Senator Kerr has estimated that 40% of taxable income in the United States is not subject to Social Security Tax. If medical care for the aged is a national problem, it should be financed from general revenues as provided in the Kerr-Mills law.

5. The Social Security approach to medical care for the aged would lead to overcrowding of existing facilities. A 1957 report by the Blue Cross Commission indicated that utilization of hospitals by Americans over 65 under Blue Cross plans was two and one half to three days per year. On the other hand, in Saskatchewan, Canada, which has "free" medical care, utilization by the same age group averages more than twice as much, or seven days per year. The reason ascribed is that the Saskatchewan plan is oriented to institutional care. Consideration should also be given to the fact that it is "free." All the Social Security proposals also are oriented towards institutional care and would be "free" to aged beneficiaries — whether they needed it or not.

6. The Social Security approach would eliminate the states' historic responsibility. Some states may be willing to escape this responsibility by putting it in the hands of the Federal Government.

It is important to realize that the Social Security approach would call for new Federal administrative machinery through which agreements to provide services would have to be made with 6,000 hospitals, 54,000 drug stores, 25,000 nursing homes, and if ultimately physicians services in general were included, 208,000 practicing physicians.

The Kerr-Mills bill, on the other hand, utilizes the already existing state public assistance mechanisms.

We must, all of us, do whatever we can to defeat the Social Security approach to medical care for the aged. We must, all of us, work in our respective states to see that every possible support is given to the implementation of the Kerr-Mills bill which is now law. The one is a piece of proposed legislation which involves compulsion and Federal control of doctor and patient. The other — the Kerr-Mills law — is a locally controlled, voluntary mechanism to help those who need the help.

We must all remember that members of Congress are not impressed by organized medicine as such. They do not react to persuasions from the American Medical Association, its Washington Office, its Council on Legislative Activities, or the American Association of Railway Surgeons. Only a Congressman's constituents can cause him to act. You and your friends at home are constituents.

American medicine is struggling for its very life, and not only is medicine and the freedom to practice free medicine at stake, but the entire free enterprise system itself, is at stake. We must not be complacent. It is time for us to roll up our sleeves and work as if our very professional lives were depending on it — because they are. Let me close with a quotation by Edmund Burke, in the middle portion of the 18th century: "To assure the triumph of evil, it is only necessary that good men do nothing."

Books

Silicosis and Other Pneumoconioses in Sweden

Axel Ahlmark, Torsten Bruce, and Ake Nystrom. Price not mentioned. Pp. 399, illustrated. Scandinavian University Books, Stockholm, 1960.

It is unlikely that silicosis and other pneumoconioses in their pathological manifestations may be different in Sweden in distinction to other countries. What may be different are the industries involved, the degree of exposure, the nature and extent of protective measures, and the management of cases that may arise. These were the areas of chief concern in the investigation leading to this book. Over a 25 year period beginning in 1931, some 2,250 cases of pneumoconioses came to the attention of various insurance facilities in Sweden. These cases were investigated thoroughly, seeking answers to such questions as the following:

Has the silicosis situation changed in the past decades?

Can transfer to "safe" surroundings hinder progression of mild silicosis to serious disease?

Is the disease still commonly fatal?

Is tuberculosis a frequent complication and has it a decisive prognostic influence?

Should technical measures of various types be utilized for protective purposes more than at present?

To what extent has the progressive industrialization created new risks of pneumoconiosis?

The "other pneumoconioses" investigated were: asbestosis; talcosis; aluminosis; siderosis; berylliosis; hard-metal pneumoconiosis; and anthracosis.

In connection with prevention, one step is at striking variance to practice in the United States. In highly dusty areas in which dust control proved difficult, on an arbitrary basis workers were removed from further employment in the absence of any evidences of involvement. In the United States the disposition and effort would be to bring the exposure under adequate control and to keep all workers employed.

Fundamentally this is a statistical investigation, and the statistical analyses made are impressive and exhaustive.

In the United States somewhat regularly x-ray films of the pneumoconioses are not well produced in publications, and common belief is that such reproduction is impossible or at least difficult. This is belied in this present book wherein numerous x-ray films are presented in clarity that approaches the flat films themselves. Publishers in this country may well take heed, and that statement applies to this Journal which is one of the guilty parties.

Abdominal Operations

Rodney Maingot. Fourth edition. $29.50. Pp. 1402, 1883 illustrations. Appleton, Century, Crofts, Inc., New York, 1961.

This magnificent book is a fitting sequel to the third edition published six years ago. In the preface the author states, "This work is intended to present a detailed account of abdominal operations as practiced today." This reviewer could find little reason to believe that this objective has not been achieved.

Such new developments as ulcerogenic pancreatic tumors and control of blood and lymph stream tumor cell spread are discussed. The chapters on intestinal obstruction are admirable, as are those on gastroduodenal operations, with one exception. The description of vagotomy has not been brought up to date. The chapter on diaphragmatic hernia is inadequate.

One advantage of this textbook is the inclusion of a great deal in addition to operative technique. There are many historical references. Pre and postoperative care, management of complications, and end results are exhaustively explored. Clinical and diagnostic considerations, radiological and pathological aspects, and other details important to the abdominal surgeon, are discussed in connection with most of the lesions. Several British and American contributors have aided him, but the author is personally responsible for the largest portion of this large book. The illustrations and charts are generally excellent, and about half of them are new. The bibliography is enormous, and many valuable direct quotations of others are included, often when they disagree with the author.

The few criticisms which can be made of this book hardly lessen its over-all pre-eminence as a masterful production in an enormous field of surgery. —CHESTER C. GUY, M.D.

Proceedings of the Fourth National Cancer Conference

Sponsored by American Cancer Society, Inc., and National Cancer Institute. Minneapolis, September 13-15, 1960. $9.00. Pp. 774. J. B. Lippincott Company, Philadelphia, 1961.

It is sheer provincialism when a book reviewer in the presence of a substantial publication directs the attention of his reading audience to just a few chapters of outstanding import. That

is conducive to narrowness, and never let it be said that the industrial physician is given to narrowness. However, just that will be done, but not until all bases of charge of provincialism shall have been removed by the statement that this 1961 publication is the best portrayal of the total cancer situation as appraised by some of the best brains assembled in a top level conference on cancer. After many pages devoted to general considerations appropriate to cancer this book records the presentations in numerous segregated areas such as: Cancer of the Breast; Cancer of the Lung; Cancer of the Female Genital Tract; Cancer of the Gastrointestinal Tract; Cancer of the Male Genitourinary; Leukemias and Lymphomas; Cancer of the Skin; Clinicopathologic Conference; Cancer of the Head and the Neck. Then the book reverts to the general with appropriate chapters on: The Role of the Medical School in Cancer Education; Periodic Cancer Detection Examinations as a Cancer Control Measure; Frontiers in Cancer Epidemiology; The Public Health Service's Program in Cancer Control; The Dental Profession and Cancer Control; The Role of the State Health Officer in Cancer Control. Now in respect to those chapters with immediate appeal to the industrial physician, they are: Industrial Carcinogens; Air Pollution and Cancer; Food Additives and Contaminants; Radiations, Natural and Man-Made. While industry provides the direct causation of fair frequency and diversity of cancers, the industrial physician will see a much larger number of cancers of origin wholly apart from industrial pursuits. It is no function of the industrial physician to take responsibility for these cancers, but it is his responsibility to recognize their existence and to make proper referrals.

As far as cancer is concerned, this book affords much for guidance in any situation involving cancer recognition.

Progress in Clinical Surgery

Rodney Smith. Second edition. $11.50. Pp. 327, 110 illustrations. Little, Brown & Co., Boston, 1961.

The first edition of this book, in 1954, was highly recommended by the undersigned, particularly for those preparing for their "Board" examinations. This second series, consisting of 22 chapters, 327 pages, and 110 illustrations from the pens of Mr. Smith and 22 others, can also be recommended for up-to-date discussions of a variety of surgical subjects.

The first three chapters deal with the advances and still unsolved problems in cardiovascular surgery, and are extremely informative to one with limited experiences in this field. The 13 pages on hyperparathyroidism are excellent and will describe the difficulties in diagnosis and surgical treatment of this disease. The same comments apply to the 12 pages on Cushing's syndrome. The management of thyrotoxicosis is perhaps the best exposition of this subject that this reviewer has ever read, and the chapter on thyroiditis summarizes the current thoughts on auto-immunity in this interesting disease. Discussions of hiatal and abdominal hernia are brief but good. Hepatectomy, bile duct strictures and hepatic coma are well reviewed, as are the various opinions regarding the surgical treatment of pancreatic tumors and inflammations, a chapter written by Mr. Smith. He obviously takes a "dim view" of radical operations for pancreatic carcinoma.

The orthopedic surgeon will find much of interest in the chapter on the management of congenital dislocation of the hip, particularly in the details of the surgical attack; and the urologist can read with profit about transplantation of the ureters. Other chapters are devoted to the treatment of bleeding esophageal varices, ascites, Hirschspring's disease, tetanus, and pulmonary metastases. Diverticulitis of the colon is covered in a classical eight page review.

Most of the British authored surgical books make delightful and interesting reading, and this one is no exception. Senior surgical residents can be urged to study it. All general surgeons can profit from it. —CHESTER C. GUY, M.D.

Circulatory Ulcers, A Physical Approach

H. G. Tranchell and C. R. Bannister. $3.50. Pp. 91, 16 illustrations. John Wright & Sons, Ltd., Bristol, England, and The Williams and Wilkins Co., Baltimore, 1960.

This little book of 91 pages and 16 illustrations is written by physiotherapists, describing their contributions to the healing of chronic leg ulcers. There is very little in it that will appeal to the general surgeon, and it is chiefly of value to the student of physical medicine.

Much could be added to make any future editions more valuable. Buerger's exercises, for example, are mentioned but not described. The differential diagnosis of deep thrombophlebitis, and the indications for surgical treatment, i.e., vein stripping and ulcer excision with grafting, could well be added. The various medicaments for the local treatment of the ulcer are well discussed.

—CHESTER C. GUY, M.D.

INDUSTRIAL MEDICINE AND SURGERY

ESTABLISHED 1932

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November, 1961

VOLUME XXX

NUMBER 11

Nickel, Tobacco Smoking and Lung Cancer

Over a period of years the two Sundermans and their associates have investigated the toxic properties of nickel. In singular fashion their investigations and publications have been directed to the carcinogenic activity of nickel. In their latest publication, (*American Journal of Clinical Pathology*, 35:203, March, 1961), the emphasis centers about nickel as a pulmonary carcinogen.

From that publication, (which is number XI in the series), several extracts are now presented:

For the past several years, we have been engaged in studying the toxic effects of inhalations of nickel and, in particular, the vapors of nickel carbonyl. Recently our interest has been focused on the carcinogenic effects of inhalations of nickel carbonyl upon the respiratory tract. The present paper is concerned with the implication of nickel as a carcinogen in tobacco smoke.

When finely divided nickel or its compounds come in contact with carbon monoxide, nickel carbonyl is formed. Nickel carbonyl is widely used commercially and is one of the most toxic gases encountered in industrial operations.

The 22nd American Conference of Governmental Hygienists in April 1960 placed the maximal atmospheric concentration for a working day at 1 part per billion (by comparison hydrogen cyanide was placed at 10 parts per million). Nickel carbonyl is unstable under atmospheric conditions and if inhaled, nickel is presumed to be deposited in highly active form on the respiratory mucosa. The high volatility of nickel carbonyl creates a special hazard of exposure by inhalation during handling.

In industrial operations elaborate detection systems have been devised and stringent regulations are enforced to protect workers from both acute and chronic exposures to vapors of nickel carbonyl. In an effort to approach the proposed average value for maximal atmospheric concentration of nickel carbonyl in air of 1 part per billion for a working day, the attitude has been adopted that any detectable exposure to nickel carbonyl is excessive and should be eliminated. Our present studies indicate that nickel in the main-stream cigarette smoke is present in concentrations of approxi-

mately 140 parts per billion. It is, therefore, logical that efforts should be made to eliminate nickel vapors from tobacco smoke.

Measurements have been made of the nickel content in cigarettes and of the partition of nickel in the ash and butt, main-stream and side-stream smokes. Six common brands of American cigarettes contained from 1.59 to 3.07 μg. of nickel per cigarette. Twenty percent of the total nickel was recovered from the main-stream smoke. Similar measurements were made on cigar and pipe tobaccos.

The carcinogenic effects of inhaled nickel upon the respiratory tract have been reviewed. It has been estimated that the amount of nickel inhaled in 1 year by a heavy cigarette smoker is approximately 3 times the amount of inhaled nickel which we have previously reported to be carcinogenic for the rat -- an animal notably resistant to the induction of pulmonary cancer.

In the light of these investigations it is our considered opinion that attempts should be made to remove nickel from tobacco smoke.

Pneumonoultramicroscopicsilicovolcanoconiosis

The honor or ignominy of fostering the longest word in the English language has become the lot of industrial medicine. That the word serving as the caption of this editorial is the longest, having 45 letters, is attested by the publishers of the Third Edition of *Webster's New International Dictionary* (unabridged), newly presented to the public.

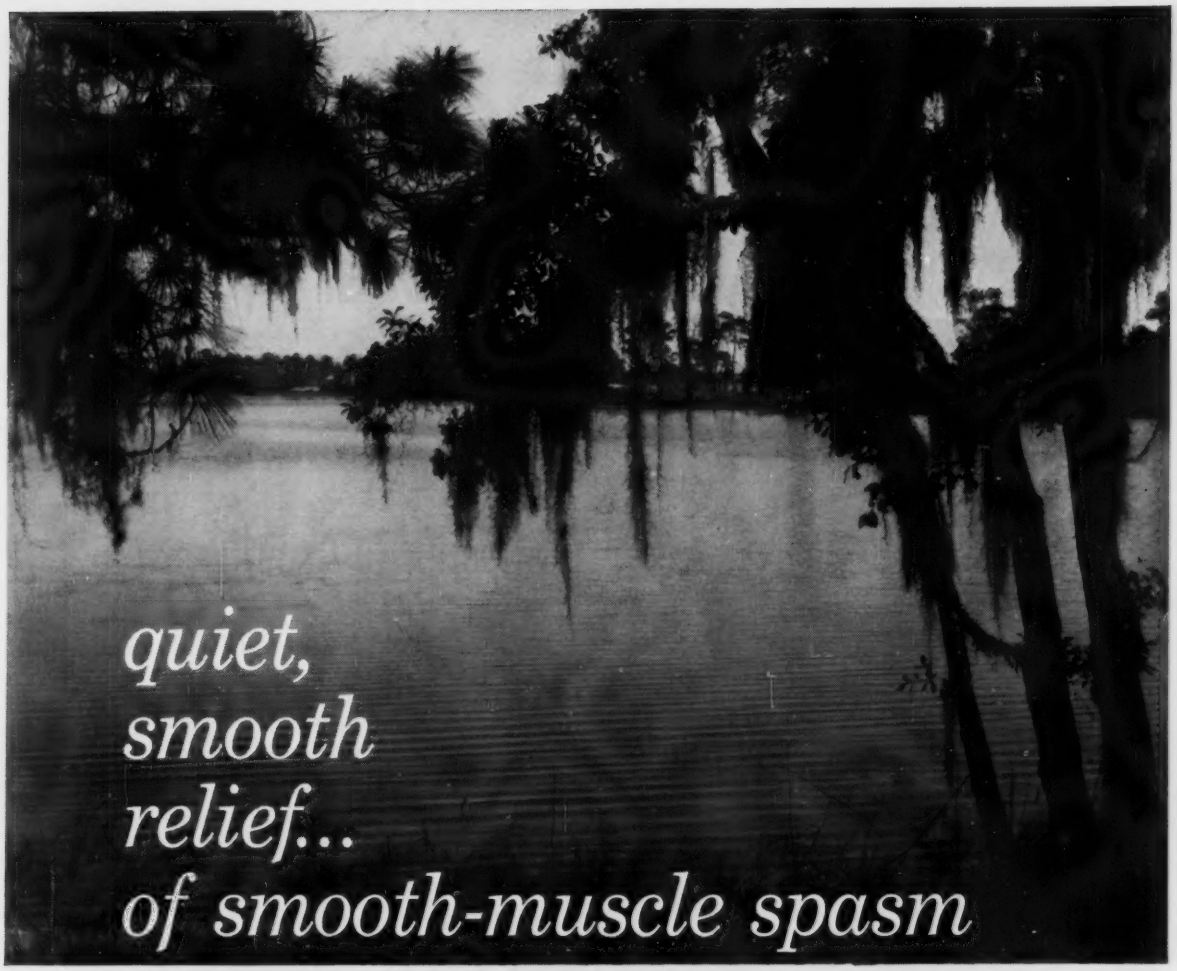
That word invites dissection, and that invitation is accepted. The first prefix "pneumono," from the Greek word for the lungs, gave way even among the Greeks to the shortened form "pneumo." By common consent the latter prefix has reached wide medical usage as in "pneumothorax" and "pneumoconiosis," but "pneumonoconiosis" still is an acceptable form. The second segment of the formidable word is "ultramicroscopic." It so happens that the major dusty lung diseases such as silicosis are caused foremostly by dust in particle size not in the ultramicroscopic range. That appreciably reduces the number of diseases to which this long word possibly might have been intended to apply. Then comes the further prefix, "silico." This distinctly confines the possible diseases to the total deriving from the element and metaloid, silicon.

The most circumscribing of the segments of this word is next, "volcano." Only a trifling portion of the earth's rock and minerals was extruded by volcanoes. Chiefly extruded are basalt and pumice, both silicates and, rightly, never charged with the causation of significant dusty lung disease. Had the word coiner substituted for "volcano," the prefix "igneo," the territory for possible coverage thereby greatly would have been extended. No carping may be laid at the door of "conio" which properly relates to dust or to "osis" specifying disease.

Thus it comes about that the longest word in the English language, and on that account one destined to flows of comment, is meaningless, although its several parts are meaningful. There is no such disease. Possibly this word confounder sought to clothe "silicosis" with all its attributes. Regardless of intent, what was accomplished was the neat thrusting of "silicosis" far away from diagnostic consideration. By several exclusions all is eliminated. This volcanic mountain having gone into labor has brought forth only a ridiculous *mot*.

The Germans are devoted to the creation of ponderous words, but their words are meaningful. Their *Schützungsgrabungsvernichtungsautomobil* is a functional picture of a tank — a military tank. But would it not have been better to have discovered "tank" and have stopped right there? In fact the Germans did create *Panzerwagon*, and that is some improvement.

If this English word, that takes more space on the page and uses more ink from the fountain pen than any other, was devised in levity and dedicated to the world of persiflage, then industrial medicine will go along in great good humor. If it develops that even a puzzled few look upon this poly-poly-poly-polysyllabic word with gravity, industrial medicine in a quick burst of scoffing will deny paternity. If pressed as to responsibility it will disclaim any degree of kinship.



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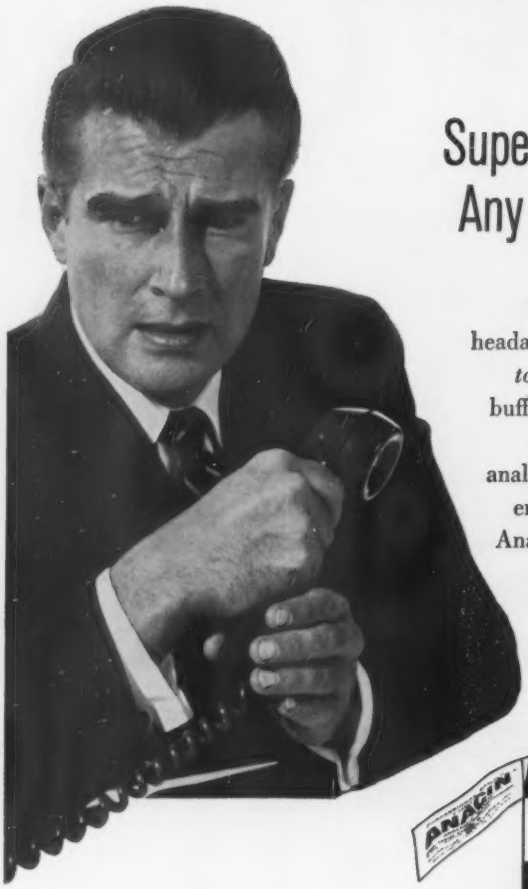

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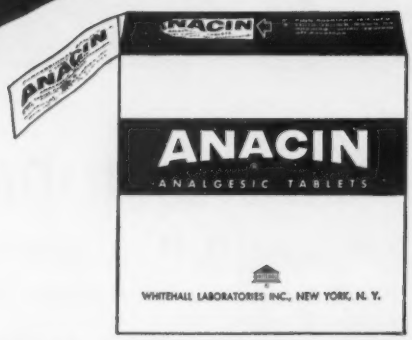

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COMMENT AND OPINION

Slowing the Heart

Applying an electrical shock to the outside of the chest, a method which has been used since 1956 in emergencies when the heart fibrillates and stops pumping blood, has also proved effective in overcoming the kind of excessively rapid heart rhythm most frequently treated by drugs. This was reported last month before the American Heart Association's 34th Annual Scientific Sessions by Drs. Paul M. Zoll, Arthur J. Linenthal and M. D. Phelps, Jr. of Boston.

Episodes of tachycardia are common problems in persons with various forms of coronary artery disease. Sometimes the usual drug treatment is ineffective even in very large doses, and the drugs may produce serious side effects. The Boston team reported that they had used a strong external electric shock to slow pulse rates as high as 175 to 240 beats per minute in five seriously ill patients. The rapid beating stopped immediately. The team said application of the shock proved quite safe even though brief general anesthesia had to be administered. The treatment, they added, may be useful in overcoming other disturbances of the heart rhythm.

Medicine Comes to the Fair

An American Museum of Health has been granted a Charter, as an educational institution, by the Board of Regents of the University of the State of New York, according to Dr. Robert L. Levy, Chairman of the Board of Trustees of the new corporation.

The newly-created institution will erect a $35,500,000 Hall of Medicine and Public Health at the 1964-1965 World's Fair in New York City. Robert Moses, President of the Fair Corporation, said the Fair looks forward to an outstanding exhibit supported by

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Medical Director: Dipl prev & occ med; PhD 4 yrs dir indus hygiene import organ; 5 yrs dir both med dept & dept of safety, lge indus firm; trng isotopes & radiological defense; seeks dirshp w/greater scope.

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Medical Director: Cert, occ med; Bd elig, int med; 5 yrs phy in charge, lge plant; 3 yrs Med Dir, heavy indus; seeks oppor 75% adm, 25% cl med; exc exper; any loc.

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Staff: 29; now completg 2 yr occ fellow in indus med, leadg univ; Bd elig, indus med; DNB; mil serv compltd; immed available.

Staff: Completg formal trng, import schl, PH; Bd elig, occ med; desires career post w/oppor for advancmnt; 33, well trnd.

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local and national health and related organizations.

In view of the national significance of the Museum and in recognition of the public interest that will be served by a medical and health pavilion, Fair officials have agreed that 70,000 square feet of space will be made available in the special exhibits area of the Fair.

This pavilion, which will be the principal agency for medical and health exhibits at the Fair, will be developed with the view of establishing a permanent Health Museum in New York City prior to the termination of the Fair, Dr. Levy said.

Dr. Levy announced that Edwin A. Salmon, institutional consultant and former Director of the New York University Medical Center, has been named President of the American Museum of Health Corporation. Captain Robert V. Schultz, M.D., for many years Director of audio-visual services for the United States Navy's Bureau of Medicine and Surgery, has been named Vice President and Director of the Museum. A national advisory group is being formed.

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Oxygen for Mysterious Mountain Illness

If you're used to sea level living, hard exercise at high altitudes may literally make you drown in your own body fluids, according to another report presented before the American Heart Association's annual Scientific Sessions.

The report, delivered for a team of physicians by Dr. Herbert L. Fred of Salt Lake City, told of two normally healthy athletes who left their sea level residences for a ski vacation in the Wasatch mountains of Utah. After two days of skiing at altitudes up to 11,500 feet, both men became intensely ill and had great difficulty in breathing. Their symptoms suggested some form of heart disease or pneumonia or both. Close to death, the men were brought down to an altitude of 4,500 feet and hospitalized in Salt Lake City where they recovered on bed rest and oxygen therapy.

Physical examination and x-ray studies showed that the lungs of both men were waterlogged, filled with fluid squeezed out of the blood vessels into the air spaces of the lungs. Special studies demonstrated that this was caused by spasm of blood vessels leading from the lungs to the heart, but that neither heart disease nor lung infection was present. The spasm results when individuals not accustomed to high altitudes are exposed to such environment. The investigators termed the illness "acute pulmonary edema of altitude."

To deal with this acute, often fatal illness, the report recommended that portable oxygen apparatus be considered essential equipment for ski lodges, mountaineering huts, and high camping areas. Associated with Dr. Fred in the report were Drs. Hans H. Hecht and Alexander Schmidt of Salt Lake City and Dr. Talcott Bates of Monterey, Calif.

Pitch Fume Exposure

According to the Nuclear Re-

actor Test Site, Health and Safety, Idaho Operations Office, pitch fume exposure can cause disabling injuries:

"Three disabling injuries from coal tar pitch fumes recently occurred on a construction job during application of a coal tar pitch roof.

"Personnel started work at 8:00 a.m. without benefit of eye protection or skin cream. By 10:00 a.m. four of the five man crew were experiencing facial burning, swelling, and eye discomfort. From this time on, about once an hour, the four men affected shared anesthetic prescription eye drops which a worker, who had been previously affected, had brought to the job.

"Work was stopped earlier than usual that afternoon when the eye drops were used up and personnel discomfort became acute. The doctor was phoned on arrival in town and eye drops were prescribed for all men pending an office visit the next morning, at which time three of the four men were hospitalized for treatment of corneal ulceration and facial burns.

"Heated coal-tar pitch creates greater hazards to the worker than asphalts; hence, every consideration should be given to the use of asphalts where possible as a roofing medium. The skin of workers reacts differently to pitch fumes under similar exposure conditions. Reaction is definitely more significant on sunny days due to a photosensitizing effect. The use of skin creams will merely lessen the severity of skin burns and should not be used as a substitute for cover clothing.

"Eye reaction to pitch fumes is the most serious consideration, and since working conditions cannot be particularly controlled as to sun, wind, etc., full face type masks should be minimum protection adequate for all working conditions. Such masks should have charcoal-type filters to also provide respiratory protection. Of particular significance in this case was the use of anesthetic eye drops during the course of work, which lulled the normal human defenses and permitted eye injury beyond that of normal tolerance. This condition could occur in welding and other locations as well; hence, the use of anesthetic eye drops should be prohibited during the course of any work without special eye protection and *medical supervision.*"

—*Hazards Exchange Bulletin*, Lawrence Radiation Laboratory of the University of California, August, 1961.

Removing the Barriers

Results of a massive nationwide study — the first of its kind ever made — designed to find ways of removing architectural barriers confronting the physically handicapped will be announced at the annual convention of the National Society for Crippled Children and Adults, the Easter Seal Society, November 17 to 21 at the Denver Hilton Hotel, Denver.

With the leadership of the National Society and the President's Committee on Employment of the Physically Handicapped and participation of 40 national organizations, the study and findings were made by the American Standards Association over a two-year period.

The findings, in the form of accepted standards for buildings which will affect every community in

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the ORIGINAL, oral, anti-inflammatory enzyme tablet

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- reduces inflammation
- eases pain
- speeds healing

Orenzyme effectively reduces both morbidity and length of convalescence in phlebitis. In a recent study, oral trypsin therapy was given to phlebitis patients "... unresponsive to the conventional forms of therapy." Results were conclusive—good to excellent response in all 35 cases.*

Composition: Each tablet contains trypsin 68%, chymotrypsin 30%, ribonuclease 2%, equivalent in proteolytic activity to 20 mg. of crystalline trypsin.

Side Effects: Orenzyme has a wide margin of safety. Toxic reactions and side effects are exceedingly rare. If they occur, discontinuation of the drug is recommended. Orenzyme is compatible with all commonly used drugs, including antibiotics. In infection, appropriate antibiotics should be used concurrently.

Dosage: Adequate dosage is important. Swallow initially, two tablets q.i.d. For maintenance, one tablet q.i.d.

Supplied: Bottles of 48 and 500 red, enteric coated tablets.

*Coleman, J.M., et al.: South. M.J. 53:1467, 1960.

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a short story on

Industrial Dermatitis

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the nation, will be announced by Leon Chatelain, Jr., a Fellow and former president of the American Institute of Architects. His presentation, "A Blueprint for Action," will be the first public report made on the study. Hundreds of parents, volunteers and friends of the crippled will initiate action to make schools, libraries, churches and other public buildings accessible to the wheelchair and crutch user. In essence, this unified national project will serve to make front door citizens of all who have handicaps.

Ways to prevent and treat spine and hip fractures common among the aged will be sought in a new two-year research project announced by the Easter Seal Research Foundation.

Basic scientific research will be conducted by a research team in the Department of Surgery at the University of California Medical Center, Los Angeles. The researchers will investigate both normal and abnormal bone with special emphasis on osteoporosis.

Marshall R. Urist, M.D., Associate Clinical Professor of Surgery at the Medical Center, points out that 26% of all aging women and approximately 15% of all aging men have been found to develop osteoporosis frequently with fractures resulting in severe physical disability. Dr. Urist believes that this is one of the most important problems facing the orthopedic surgeon today and that basic laboratory research on osteoporosis offers the greatest hope for finding ways to prevent and treat spontaneous fractures of the hip and spine. The rate of turnover of bone in the skeleton is high in osteoporosis. It is necessary to determine whether this can be confirmed by further investigations and if bone turnover can be slowed by treatment with a combination of exercise, hormones, and diet.

How to Enter a Tank

An eight page pamphlet on recommended safe practices and procedures for entering tanks and other enclosed spaces is now available from the Manufacturing Chemists' Association, Inc.

The publication, SG-10, emphasizes that hazards inherent in tank entry can be avoided or overcome by following three basic principles:

Establish a definite system of pre-planning for tank entry and a worker instruction program;

Prepare the vessel for entry by physically isolating it, cleaning it to remove contaminants, and testing it to insure absence of such contaminants;

Use a formal permit system requiring written authorization for entry to be issued only after the supervisor in charge is satisfied personally with tank preparation, precautions to be taken, personal protective equipment to be used, and procedures to be followed.

Among the hazards commonly present are toxic vapors in fatal concentrations; flammable gases with potential fire or explosion;

lack of oxygen; electric shock from portable lights, tools, or associated electrical equipment; injury from mechanical equipment such as mixers, conveyors, etc., inadvertently activated; bodily injury from direct contact with corrosives or dermatitis-producing chemicals; physical hazards such as slipping, falling, and falling objects; and burns resulting from accidental opening of a steam valve in a line which has not been blanked off or disconnected.

Also available is "Properties and Essential Information for Safe Handling and Use of Methyl Ethyl Ketone," latest chemical safety data sheet, SD-83, prepared by the Association.

This booklet details the properties, hazards, engineering control of hazards, employee safety, fire fighting, handling and storage, tank and equipment cleaning and repairs, waste disposal, medical management, and first-aid. The pamphlet describes methyl ethyl ketone as a flammable liquid with a low flash point, the vapors of which form explosive mixtures with air. SD-83 points out that although industrial use of this chemical does not present a serious health hazard, undesirable effects may occur from inhalation of excessive concentrations of vapor, prolonged or repeated skin contact with the liquid, and from contact of the liquid with eyes.

Copies of SG-10 and SD-83 are available for 30 cents per copy from the Manufacturing Chemists' Association, Inc., 1825 Connecticut Ave., N.W. Washington 9, D. C.

The Russians are Competing

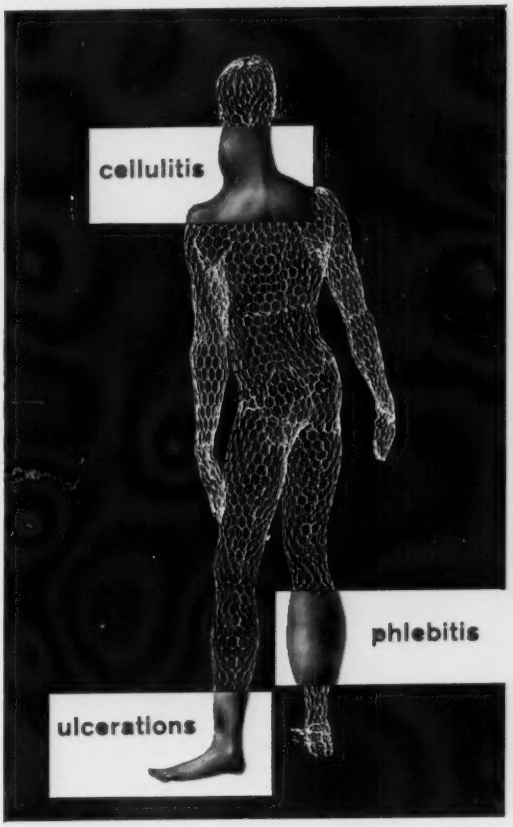
Soviet medical science has a "terrific sense of competition" with the rest of the world and is quick to convert its early research successes to practical application. This is the opinion of three Public Health Service scientists who recently spent a month visiting major infectious disease research centers in the Soviet Union.

The scientists, Dr. Robert J. Huebner, Dr. Alexis Shelokov and Dr. Robert M. Chanock, all virologists from the Service's National Institute of Allergy and Infectious Diseases, Bethesda, Maryland, represented the 1961 Infectious Diseases and Microbiological Exchange Mission to the U. S. S. R.

Accompanied by three other mission members, Dr. William McD. Hammon of the University of Pittsburgh, Dr. Fred M. Davenport of the University of Michigan, and Dr. Edwin H. Lennette of the California State Department of Health, the group visited medical research centers in Moscow, Leningrad, Kiev, and peripheral laboratories in Uzbekistan and Georgia.

Medical research in the Soviet Union is carefully and methodically planned, the Americans found. National goals are established by the Academy of Medical Sciences in Moscow. Within this framework, however, the average scientist feels he has sufficient freedom to pursue his studies, guided by the goals set by senior scientists of the Academy.

Soviet scientists wonder, according to Dr. Huebner, how the United States achieves its medical successes without similar planning, although they recognize the leadership of the United States in fields such as virology.



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- **reduces inflammation**
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- **speeds healing**

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Composition: Parenzyme is purified crystallized trypsin for intramuscular use. **Orenzyme:** Each tablet contains trypsin 68%, chymotrypsin 30%, ribonuclease 2%, equivalent in proteolytic activity to 20 mg. of crystalline trypsin.

Side Effects: Parenzyme has a wide margin of safety and is rarely contraindicated. Toxic reactions following intramuscular use of Parenzyme are exceedingly rare. Although trypsin is a normal product of the human body, it is possible that sensitivity to it may be present or be produced by the administration of Parenzyme. The usual precautions should be observed as for the injection of any protein material, with sensitivity testing when indicated.

Parenzyme is compatible with all commonly used drugs, including antibiotics. In infection, appropriate antibiotic therapy should be used concurrently.

For complete details on indications, dosage, administration and side effects, see insert included with each package.

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RESPONSIVE TO TRIAMCINOLONE

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■ enhanced anti-inflammatory, antiallergic, antipruritic effects ■ far less gastrointestinal distress ■ may be of value when other corticoids have failed ■ virtually **no** mood changes, edema, sodium or water retention, or secondary hypertension

Supply: Scored tablets of 1 mg., 2 mg. and 4 mg. Syrup, in 120 cc. bottles, each 5 cc. teaspoonful containing 5.1 mg. triamcinolone diacetate providing 4 mg. triamcinolone.

*Glaser, J.: Ann. Allergy 18:510 (May) 1960.

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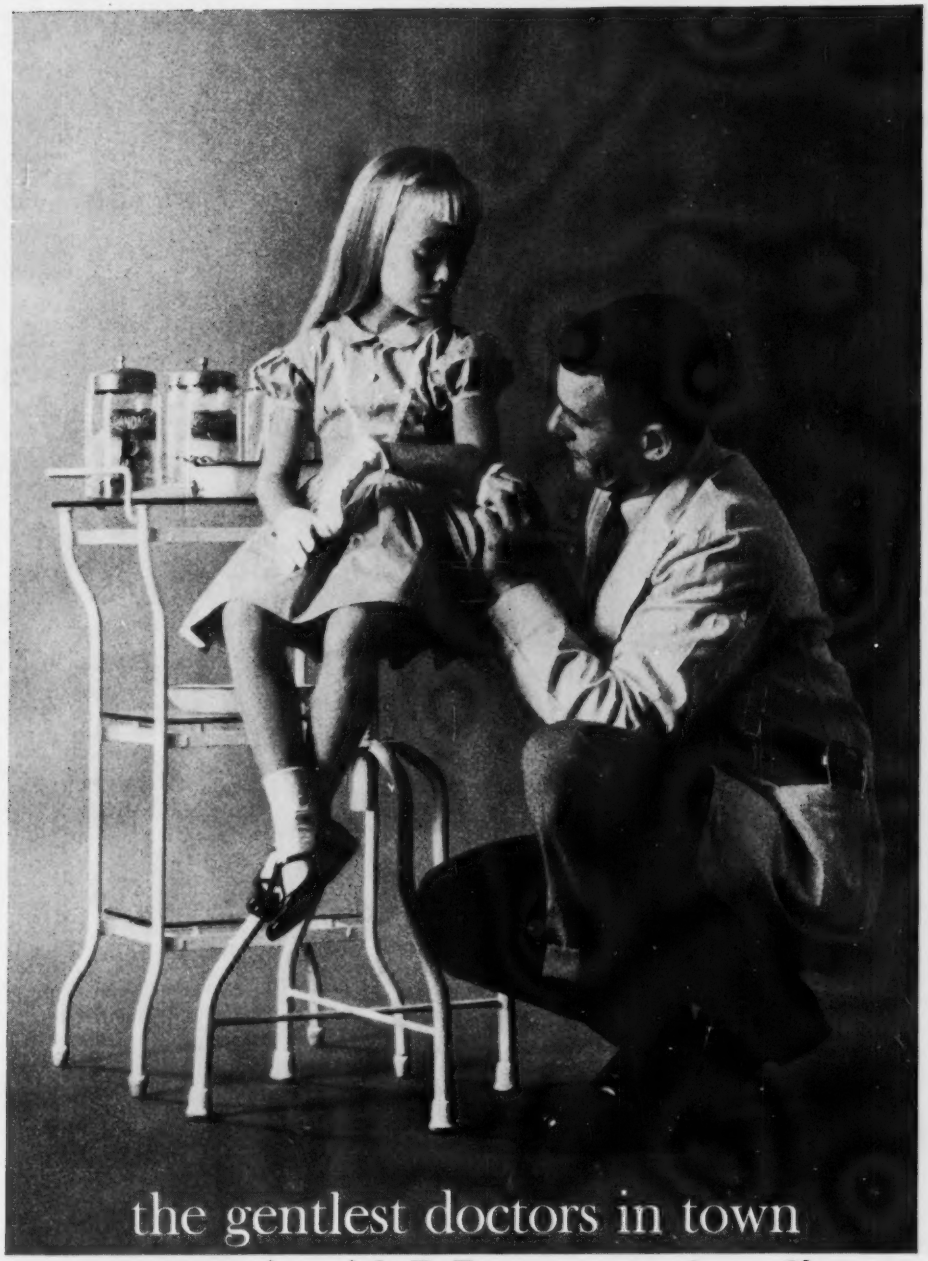

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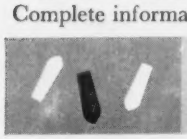

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No. 11 *in a series of washroom survey comments from "SBS soap counselors"*

We showed them how to end Soap Waste permanently!

James B. Workman

SBS Soap Counselor on the Eastern Seaboard, has helped many plants update their wash-up practices. Here's his report after surveying a electrical equipment manufacturing plant:

"We observed the usual powdered soap waste in 23 of the 26 washrooms surveyed. Soap scattered about made an unsightly mess of the washbasins, made the floors dangerously slippery and made cleaning-up twice the job it should have been. You could see the plant's hygiene dollars — both manpower and materials — literally disappearing down the drains!

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because the 2% concentration of Panzalone Cream helps assure quick relief of symptoms and more rapid healing of lesions,

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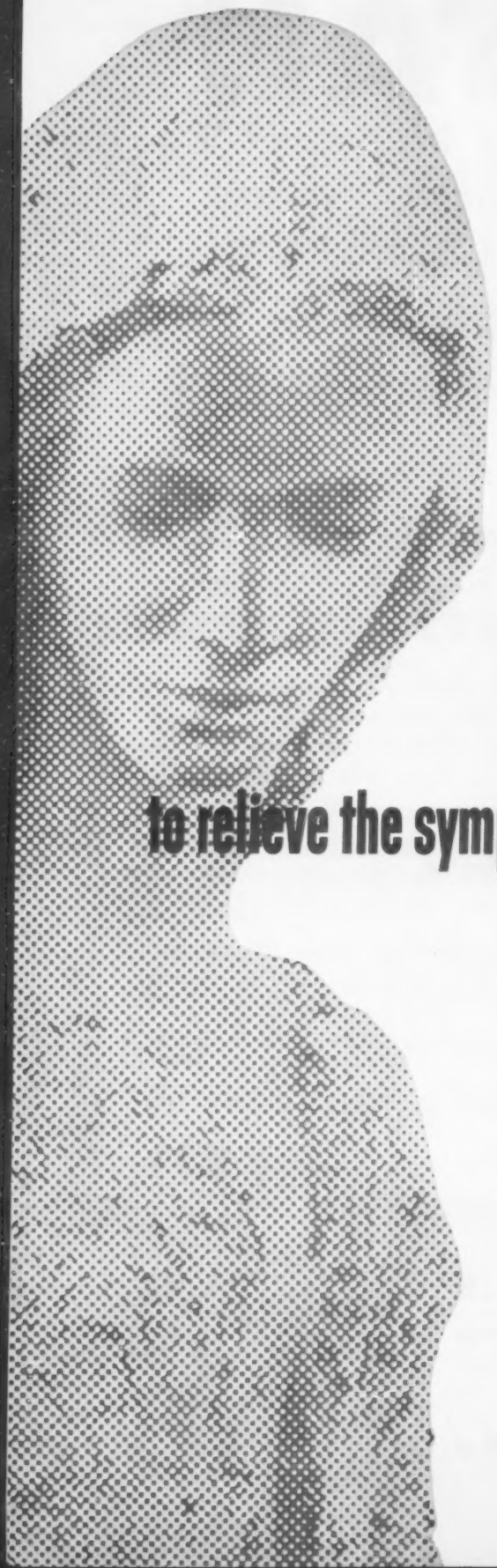

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